(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 380 209 A1

(12) EUROPEAN PATENT APPLICATION

published in accordance with Art. 158(3) EPC

(43) Date of publication:
14.01.2004 Bulletin 2004/03

(21) Application number: **02717180.0**

(22) Date of filing: **16.04.2002**

(51) Int Cl.[7]: **A01N 37/24**, A01N 37/28, A01N 37/34, A01N 41/10, A01N 43/28, A01N 43/40, A01N 43/56, A01N 43/58, A01N 43/88, A01N 47/02, A01N 51/00, A01N 57/22

(86) International application number:
PCT/JP2002/003780

(87) International publication number:
WO 2002/087334 (07.11.2002 Gazette 2002/45)

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **17.04.2001 JP 2001118840**
26.04.2001 JP 2001129588

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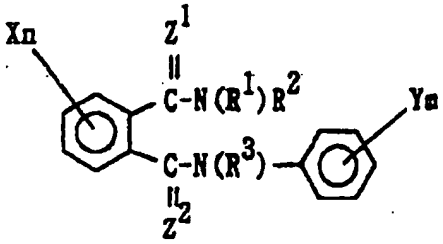
(54) PEST CONTROL AGENT COMPOSITION AND METHOD OF USING THE SAME

(57) The present invention relates to a composition for noxious organisms-controlling agent having a synergistic effect and a method for using said composition, which comprises, as active ingredients thereof, one or more compounds selected from the phthalamide derivatives represented by general formula (I) being useful as an insecticide or acaricide and one or more compounds selected from the compounds having insecticidal, acaricidal or nematocidal activity:



(I)

wherein R^1, R^2 and R^3 may be the same or different and each represent hydrogen atom, C_3-C_6 cycloalkyl, -A^1-Qp, etc., each of X and Y may be the same or different and represents hydrogen atom, halogen atom, etc., n is an integer of 1 to 4, m is an integer of 1 to 5, and each of Z_1 and Z_2 represents O or S .

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Description

TECHNICAL FIELD

[0001] The present invention relates to a composition for noxious organisms-controlling agent having a synergistic effect and a method for using said composition, which comprises a phthalamide derivative represented by general formula (I) being useful as an insecticide or acaricide and one or more compounds selected from the compounds having insecticidal, acaricidal or nematocidal activity.

BACKGROUND ART

[0002] The phthalamide derivatives of the present invention represented by general formula (I) are known compounds disclosed in JP-A-11-240857 and JP-A-2001-131141, wherein it is mentioned that these compounds have an insecticidal or acaricidal activity.

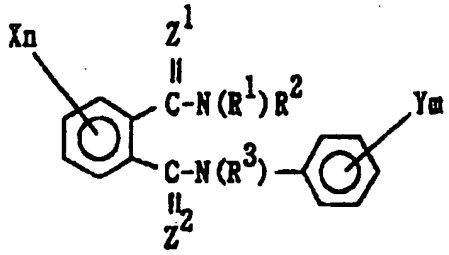
[0003] On the other hand, the compounds having insecticidal, acaricidal or nematocidal activity, as the second active ingredient of the present invention, are known compounds as disclosed in The Pesticide Manual Eleventh Edition 1997, etc.

DISCLOSURE OF THE INVENTION

[0004] There exist many noxious organisms which are difficult or impossible to control by the use of a single member selected from the phthalamide derivatives represented by the general formula (I) of the present invention and the insecticidal, acaricidal or nematocidal compounds. Accordingly, it is expected that discovery of the means and method for the effective control of such noxious organisms will lead to a more effective production of crop plants.

[0005] With the aim of solving the problem mentioned above, the present inventors have conducted extensive studies. As a result, it has been found that a plurality of noxious organisms can be controlled effectively by the combined use of one or more compounds selected from the phthalamide derivatives represented by the general formula (I) and one or more compounds selected from the insecticidal, acaricidal or nematocidal compounds. The present invention has been accomplished on the basis of this finding.

[0006] The present invention relates to a composition for noxious organisms-controlling agent comprising, as active ingredients thereof, one or more compounds selected from the phthalamide derivatives represented by the general formula (I):



(I)

wherein R^1, R^2 and R^3, which may be the same or different, each represent a hydrogen atom, a C_3-C_6 cycloalkyl group, a halo C_3-C_6 cycloalkyl group or -A^1-Q_p (in this formula, A^1 represents a C_1-C_8 alkylene group, a C_3-C_6 alkenylene group or a C_3-C_6 alkynylene group; Q represents a hydrogen atom; a halogen atom; a cyano group; a nitro group; a halo C_1-C_6 alkyl group; a C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkyl group; a C_1-C_6 alkoxycarbonyl group; a di C_1-C_6 alkoxyphosphoryl group in which the alkoxy groups may be the same or different; a di C_1-C_6 alkoxythiophosphoryl group in which the alkoxy groups may be the same or different; a diphenylphosphino group; a diphenylphosphono group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6

alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group means a pyridyl group, a pyridine-N-oxide group, a pyrimidinyl group, a furyl group, a tetrahydrofuryl group, a thienyl group, a tetrahydrothienyl group, a tetrahydropyranyl group, a tetrahydrothiopyranyl group, an oxazolyl group, an isoxazolyl group, an oxadiazolyl group, a thiazolyl group, an isothiazolyl group, a thiadiazolyl group, an imidazolyl group, a triazolyl group or a pyrazolyl group); a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; or $-Z^3-R^4$ (in this formula, Z^3 represents -O-, -S-, -SO-, $-SO_2-$ or $-N(R^5)-$ (in this formula, R^5 represents a hydrogen atom; a C_1-C_6 alkylcarbonyl group; a halo C_1-C_6 alkylcarbonyl group; a C_1-C_6 alkoxycarbonyl group; a phenylcarbonyl group; a substituted phenylcarbonyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a phenyl C_1-C_4 alkoxycarbonyl group; or a substituted phenyl C_1-C_4 alkoxycarbonyl group having, on the ring thereof, at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group), and R^4 represents a hydrogen atom; a C_1-C_6 alkyl group; a halo C_1-C_6 alkyl group; a C_3-C_6 alkenyl group; a halo C_3-C_6 alkenyl group; a C_3-C_6 alkynyl group; a halo C_3-C_6 alkynyl group; a C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkyl group; a C_1-C_6 alkylcarbonyl group; a halo C_1-C_6 alkylcarbonyl group; a C_1-C_6 alkoxycarbonyl group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a phenyl C_1-C_4 alkyl group; a substituted phenyl C_1-C_4 alkyl group having, on the ring thereof, at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group is as defined above); or a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group); and p represents an integer of 1-4); and R^1 and R^2 may be taken conjointly to form a 4- to 7-membered ring which may be interrupted by one to three, the same or different hetero atoms selected from oxygen atom, sulfur atom and nitrogen atom;

[0007] X may be the same or different and represents a hydrogen atom; a halogen atom; a cyano group; a nitro group; a C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkyl group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group is as defined above); a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; or $-A^2-R^6$ (in this formula, A^2 represents -O-, -S-, -SO-, $-SO_2-$, -C (=O)-, -C (=NOR^7) - (in this formula, R^7 represents a hydrogen atom, a C_1-C_6 alkyl group, a halo C_1-C_6 alkyl group, a C_3-C_6 alkenyl group, a halo C_3-C_6 alkenyl group, a C_3-C_6 alkynyl group, a cycle C_3-C_6 alkyl group, a phenyl C_1-C_4 alkyl group or a substituted phenyl C_1-C_4 alkyl group having, on the ring thereof, at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group), a C_1-C_6 alkylene group, a halo C_1-C_6 alkylene group, a C_2-C_6 alkenylene group, a halo C_2-C_6 alkenylene group, a C_2-C_6 alkynylene group or a halo C_3-C_6 alkynylene group, and

(1) in a case where A^2 represents -O-, -S-, -SO-or $-SO_2-$, R^6 represents a halo C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkenyl group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group,

halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group is as defined above); a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; or -A^3-R^8 (in this formula, A^3 represents a C_1-C_6 alkylene group, a halo C_1-C_6 alkylene group, a C_3-C_6 alkenylene group, a halo C_3-C_6 alkenylene group, a C_3-C_6 alkynylene group or a halo C_3-C_6 alkynylene group, and R^8 represents a hydrogen atom; a halogen atom; a C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkyl group; a C_1-C_6 alkoxycarbonyl group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; or -A^4-R^9 (in this formula, A^4 represents -O-, -S-, -SO-, -SO_2- or -C(=O), and R^9 represents a C_1-C_6 alkyl group; a halo C_1-C_6 alkyl group; a C_3-C_6 alkenyl group; a halo C_3-C_6 alkenyl group; a C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkyl group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group is as defined above); or a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group)),

(2) in a case where A^2 represents -C (=O)- or -C(=NOR^7)- (in this formula, R^7 is as defined above), R^6 represents a C_1-C_6 alkyl group; a halo C_1-C_6 alkyl group; a C_2-C_6 alkenyl group; a halo C_2-C_6 alkenyl group; a C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkyl group; a C_1-C_6 alkoxy group; a C_1-C_6 alkylthio group; a mono C_1-C_6 alkylamino group; a di C_1-C_6 alkylamino group in which the alkyl groups may be the same or different; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a phenylamino group; a substituted phenylamino group having, on the ring thereof, at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group is as defined above); or a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group, and

(3) in a case where A^2 represents a C_1-C_6 alkylene group, a halo C_1-C_6 alkylene group, a C_2-C_6 alkenylene group, a halo C_2-C_6 alkenylene group, a C_2-C_6 alkynylene group or a halo C_3-C_6 alkynylene group, R^6 represents a hydrogen atom; a halogen atom; a C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkyl group; a C_1-C_6 alkoxycarbonyl group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group is as defined above); a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; or -A^5-R^{10} (in this formula, A^5 represents -O-, - S-, -SO- or -SO_2-, and R^{10} represents a C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkyl group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group is as defined above); a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group,

halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; or -A^6-R^{11} (in this formula, A^6 represents a C_1-C_6 alkylene group; a halo C_1-C_6 alkylene group; a C_2-C_6 alkenylene group; a halo C_2-C_6 alkenylene group; a C_2-C_6 alkynylene group; or a halo C_3-C_6 alkynylene group; and R^{11} represents a hydrogen atom; a halogen atom; a C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkyl group; a C_1-C_6 alkoxy group; a halo C_1-C_6 alkoxy group; a C_1-C_6 alkylthio group; a halo C_1-C_6 alkylthio group; a C_1-C_6 alkylsulfinyl group; a halo C_1-C_6 alkylsulfinyl group; a C_1-C_6 alkylsulfonyl group; a halo C_1-C_6 alkylsulfonyl group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a phenoxy group; a substituted phenoxy group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a phenylthio group; a substituted phenylthio group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group is as defined above; or a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group))), and

n represents an integer of 1-4; and X may be taken conjointly together with an adjacent carbon atom on the phenyl ring to form a condensed ring (the term condensed ring means naphthalene, tetrahydronaphthalene, indene, indane, quinoline, quinazoline, chromane, isochromane, indole, indoline, benzodioxane, benzodioxole, benzofuran, dihydrobenzofuran, benzothiophene, dihydrobenzothiophene, benzoxazole, benzothiazole, benzimidazole or indazole), and said condensed ring may have at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group, halo C_1-C_6 alkylsulfonyl group, phenyl group, substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group, heterocyclic group (the term heterocyclic group is as defined above) and substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; and

Y may be the same or different and represents a hydrogen atom; a halogen atom; a cyano group; a nitro group; a halo C_3-C_6 cycloalkyl group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group is as defined above); a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; or -A^2-R^6 (in this formula, A^2 and R^6 are as defined above); and

m represents an integer of 1-5; and

Y may be taken conjointly together with an adjacent carbon atom on the phenyl ring to form a condensed ring (the term condensed ring is as defined above), and said condensed ring may have at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group, halo C_1-C_6 alkylsulfonyl group, phenyl group, substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl

group and halo C_1-C_6 alkylsulfonyl group, heterocyclic group (the term heterocyclic group is as defined above) and substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; and Z^1 and Z^2 represent an oxygen atom or a sulfur atom; and
one or more compounds selected from compounds having an insecticidal, acaricidal or nematocidal activity; and to a method for using said composition.

[0008] The noxious organisms-controlling agent of the present invention exhibits a marked effect even when dosage thereof is so low that any of the ingredients constituting said agent can exhibit no effect at such a low dosage if used singly, and exhibits a marked controlling effect against noxious organisms and agent-resistant noxious organisms which cannot be controlled with any of the single ingredients.

MODE FOR PRACTICE OF THE INVENTION

[0009] In the definition of general formula (I) representing the phthalamide derivative of this invention, the term "halogen atom" means chlorine atom, bromine atom, iodine atom or fluorine atom; "C_1-C_6 alkyl" means a straight or branched chain alkyl group having 1-6 carbon atoms such as methyl, ethyl, n-propyl, i-propyl, n-butyl, i-butyl, s-butyl, t-butyl, n-pentyl, n-hexyl and the like; "halo C_1-C_6 alkyl" means a straight or branched chain alkyl group having 1-6 carbon atoms which is substituted with at least one, the same or different halogen atoms; "C_1-C_8 alkylene" means a straight or branched chain alkylene group having 1-8 carbon atoms such as methylene, ethylene, propylene, trimethylene, dimethylmethylene, tetramethylene, isobutylene, dimethylethylene, octamethylene and the like;

[0010] As the "4- to 7-membered ring which may be interrupted by 1 to 3, the same or different hetero atoms selected from oxygen atom, sulfur atom and nitrogen atom" formed through a mutual combination of R^1 and R^2, for example, azetidine ring, pyrrolidine ring, pyrroline ring, piperidine ring, imidazolidine ring, imidazoline ring, oxazolidine ring, thiazolidine ring, isoxazolidine ring, isothiazolidine ring, tetrahydropyridine ring, piperazine ring, morpholine ring, thiomorpholine ring, dioxazine ring, dithiazine ring and the like can be referred to.

[0011] In some cases, the phthalamide derivative of the present invention represented by general formula (I) may have an asymmetric carbon atom or an asymmetric center in the structural formula thereof, and may have two or more optical isomers. The present invention involves all such optical isomers and mixtures consisting of the optical isomers at arbitrary ratios. In some cases, the present invention involves salts, hydrates and the like of these compounds.

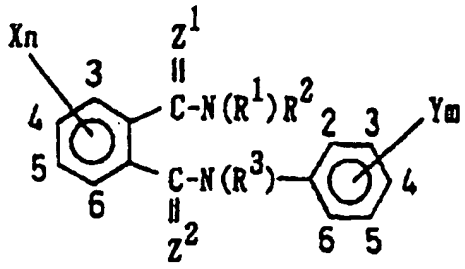
[0012] The phthalamide derivatives represented by general formula (I) can be obtained by using the compounds and production processes disclosed in JP-A-11-240857 and JP-A-2001-131141.

[0013] Among the compounds represented by general formula (I), preferable are those in which R^1 represents a hydrogen atom, R^2 represents a C_1-C_6 alkyl group, a C_1-C_6 alkylthio C_1-C_6 alkyl group, a C_1-C_6 alkylsulfinyl C_1-C_6 alkyl group or a C_1-C_6 alkylsulfonyl C_1-C_6 alkyl group, R^3 represents a hydrogen atom, X represents a halogen atom, n represents 1, Z^1 and Z^2 represent an oxygen atom, Y which may be the same or different represents a halogen atom, a C_1-C_6 alkyl group, a halo C_1-C_6 alkyl group or a halo C_1-C_6 alkoxy group, and m represents 2 or 3. Among these compounds, particularly preferable are the following compounds: N^2-(1,1-dimethyl-2-methylthioethyl)-3-iodo-N^1-{2-methyl-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]phenyl}-phthalamide, N^2-(1,1-dimethyl-2-methylsulfonylethyl)-3-iodo-N^1-{2-methyl-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-phenyl}phthalamide and N^2-(1, 1-dimethyl-2-methylsulfinylethyl)-3-iodo-N^1-{2-methyl-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-phenyl}phthalamide.

[0014] In Table 1, typical compounds of the present invention are listed. This invention, however, is by no means limited by these compounds. As examples of such compounds, the compounds disclosed in JP-A-11-240857 and JP-A-2001-131141 can be referred to.

General Formula (I)

[0015]



(I)

Table 1

(Z^1 =Z^2 =O)						
No	R^1	R^2	R^3	Xn	Ym	Property mp °C
1	CH_3	H	H	3-NO_2	2-CH_3-5-Cl	169-171
2	C_2H_5	H	H	3-Cl	2-CH_3-4-$OCHF_2$	179-180
3	C_2H_5	H	H	3-NO_2	2-CH_3-5-Cl	175-177
4	n-C_3H_7	H	H	3-NO_2	2-CH_3-4-$OCHF_2$	184-186
5	i-C_3H_7	H	H	3-Cl	4-C_4H_9-n	169-171
6	i-C_3H_7	H	H	3-Cl	4-C_4H_9-t	224-226
7	i-C_3H_7	H	H	3-Cl	4-$CF(CF_3)_2$	198-200
8	i-C_3H_7	H	H	3-Cl	4-$CF_2CF_2CF_3$	203-204
9	i-C_3H_7	H	H	3-Cl	4-$(CF_2)_3CF_3$	176-178
10	i-C_3H_7	H	H	3-Cl	4-$OCF_2CHFOC_3F_7$-n	169-171
11	i-C_3H_7	H	H	6-Cl	4-SCH_3	193-195
12	i-C_3H_7	H	H	3-Cl	4-SO_2CH_3	208-210
13	i-C_3H_7	H	H	3-Cl	4-$SCHF_2$	220-222
14	i-C_3H_7	H	H	3-Cl	4-SCF_2CHF_2	198-200
15	i-C_3H_7	H	H	3-Cl	4-$SO_2CF_2CHF_2$	227-230
16	i-C_3H_7	H	H	3-Cl	4-$COCH_3$	217-219
17	i-C_3H_7	H	H	3-Cl	4-Ph	215-217
18	i-C_3H_7	H	H	3-Cl	2-CH_3-4-OCH_3	191-192
19	i-C_3H_7	H	H	3-Cl	2-CH_3-4-CF_2CF_3	199-200
20	i-C_3H_7	H	H	3-Cl	2-CH_3-4-OCF_3	199-201
21	i-C_3H_7	H	H	3, 6-Cl_2	2-CH_3-4-$OCHF_2$	221-222
22	i-C_3H_7	H	H	3-Br	4-OCF_3	208-210
23	i-C_3H_7	H	H	3-Br	2-CH_3-4-CF_2CF_3	201-202
24	i-C_3H_7	H	H	3-Br	2-CH_3-4-$CF(CF_3)_2$	222-224
25	i-C_3H_7	H	H	3-Br	2-CH_3-4-SCH_3	215-217
26	i-C_3H_7	H	H	3-Br	2-CH_3-4-(3-CF_3-PhO)	156-158
27	i-C_3H_7	H	H	3-Br	2-CH_3-4-(5-CF_3-2-Pyi-O)	182-184
28	i-C_3H_7	H	H	3-Br	-3-OCH_2O-4-	195-198

Table 1 (continued)

(Z^1 =Z^2 =O)						
No	R^1	R^2	R^3	Xn	Ym	Property mp °C
29	i-C_3H_7	H	H	6-Br	2-CH_3-4-OCF_2CHFCF_3	212-213
30	i-C_3H_7	H	H	6-Br	2-CH_3-4-OCF_2CHClF	211-213
31	i-C_3H_7	H	H	6-Br	2-CH_3-4-OCF_2CHF_2	214-215
32	i-C_3H_7	H	H	5, 6-Br_2	2-CH_3-4-$OCHF_2$	208-210
33	i-C_3H_7	H	H	3-I	4-$CF_2CF_2CF_3$	217-219
34	i-C_3H_7	H	H	3-I	4-$CF(CF_3)_2$	209-211
35	i-C_3H_7	H	H	3-I	4-SCH_2CHF_2	195-197
36	i-C_3H_7	H	H	3-I	4-$SCHF_2$	204-206
37	i-C_3H_7	H	H	3-I	4-$S(CF_2)_3CF_3$	185-187
38	i-C_3H_7	H	H	3-I	2-CH_3-4-Cl	215-217
39	i-C_3H_7	H	H	3-I	2-Cl-4-CF_3	170-171
40	i-C_3H_7	H	H	3-I	2-CH_3-4-CF_3	202-203
41	i-C_3H_7	H	H	3-I	2-CH_3-4-CF_2CF_3	195-196
42	i-C_3H_7	H	H	3-I	2-CH_3-4-$CF_2CF_2CF_3$	193-195
43	i-C_3H_7	H	H	3-I	2-CH_3-4-$CF(CF_3)_2$	211-213
44	i-C_3H_7	H	H	3-I	2-CH_3-4-OCF_3	214-216
45	i-C_3H_7	H	H	3-I	2-CH_3-4-$OCHF_2$	207-209
46	i-C_3H_7	H	H	3-I	2-CH_3-4-$OCH_2CF_2CHF_2$	229-231
47	i-C_3H_7	H	H	3-I	2-CH_3-4-OCF_2CHFCF_3	213-214
48	i-C_3H_7	H	H	3-I	2-Cl-4-OCF_3	173-175
49	i-C_3H_7	H	H	6-I	4-$SCF(CF_3)_2$	216-218
50	i-C_3H_7	H	H	6-I	2-Cl-4-CF_3	195-196
51	i-C_3H_7	H	H	6-I	2-CH_3-4-$CF(CF_3)_2$	237-239
52	i-C_3H_7	H	H	6-I	2-Cl-4-$CF_2CF_2CF_3$	199-200
53	i-C_3H_7	H	H	3-F	2-CH_3-4-$CF(CF_3)_2$	241-243
54	i-C_3H_7	H	H	3-F	2-CH_3-4-OCF_3	183-184
55	i-C_3H_7	H	H	3-NO_2	3-F	228-230
56	i-C_3H_7	H	H	3-NO_2	2-CH_3-4-$OCHF_2$	186-188
57	n-C_4H_9	H	H	3-NO_2	2-CH_3-5-Cl	172-174
58	s-C_4H_9	H	H	6-Cl	2-CH_3-4-$OCHF_2$	213-215
59	t-C_4H_9	H	H	3-NO_2	2-CH_3-4-$OCHF_2$	172-173
60	c-C_3H_5	H	H	3-Cl	2-CH_3-4-$OCHF_2$	156-158
61	c-C_4H_7	H	H	3-NO_2	2-CH_3-5-Cl	206-208
62	c-C_5H_9	H	H	3-NO_2	2-CH_3-5-Cl	200-202
63	c-C_6H_{11}	H	H	3-NO_2	2-CH_3-5-Cl	225-227
64	$CH_2C_3H_5$-c	H	H	3-NO_2	2-CH_3-5-F	190-192
65	CH_2CH_2Cl	H	H	3-NO_2	2-CH_3-5-F	179-181
66	$CH_2CH=CH_2$	H	H	3-NO_2	2-CH_3-4-$OCHF_2$	194-195
67	$CH_2C\equiv CH$	H	H	3-NO_2	2-CH_3-4-$OCHF_2$	190-191
68	i-C_3H_7	H	H	3-Cl	4-CH=CBr_2	209.8-214.8
69	i-C_3H_7	H	H	6-Cl	4-CH=CCl_2	199.7
70	i-C_3H_7	H	H	3-I	4-CH=C(Cl)CF_3	196.6
71	i-C_3H_7	H	H	6-I	4-CH=C(Cl)CF_3	203.3
72	t-C_4H_9	H	H	3-I	2-CH_3-4-CF_2CF_3	205-207
73	t-C_4H_9	H	H	6-I	2-CH_3-4-CF_2CF_3	216-217
74	n-C_4H_9	H	H	6-I	2-CH_3-4-CF_2CF_3	181.8-187.7
75	n-C_5H_{11}	H	H	6-I	2-CH_3-4-CF_2CF_3	168.7-171.3

Table 1 (continued)

(Z^1 =Z^2 =O)						
No	R^1	R^2	R^3	Xn	Ym	Property mp °C
76	i-C_3H_7	H	H	6-CH_3	2-CH_3-4-CF_2CF_3	177-179
77	$CH_2CH_2OC_2H_5$	H	H	3-I	2-CH_3-4-CF_2CF_3	146.5-150.3
78	$CH_2CH_2OC_2H_5$	H	H	6-I	2-CH_3-4-CF_2CF_3	157.3-160.4
79	c-C_5H_9	H	H	6-I	2-CH_3-4-CF_2CF_3	205.2
80	c-C_6H_{11}	H	H	6-I	2-CH_3-4-CF_2CF_3	239.0-244.4
81	i-C_3H_7	H	H	3-I	4-SCF_3	226-227
82	i-C_3H_7	H	H	3-NO_2	4-$SOCF_3$	202-205
83	i-C_3H_7	H	H	3-Cl	4-$SOCF_3$	242-244
84	i-C_4H_9	H	H	3-I	2-CH_3-4-CF_2CF_3	200.4-206.8
85	s-C_4H_9	H	H	6-I	2-CH_3-4-CF_2CF_3	216.1-218.0
86	$CH(C_2H_5)$--CH_2OCH_3	H	H	3-I	2-CH_3-4-CF_2CF_3	177
88	$CH(C_2H_5)$--CH_2OCH_3	H	H	6-I	2-CH_3-4-CF_2CF_3	198.3-201.0
89	CH_2CF_3	H	H	6-I	2-CH_3-4-CF_2CF_3	184.7-202.5
90	i-C_3H_7	H	H	3-I	3-N=C(CF_2CF_3)O-4	214-216
91	t-C_4H_9	H	H	3-I	3-N=C(CF_2CF_3)O-4	253-254
92	i-C_3H_7	H	H	3-Cl	2-F-4-OCF_3	126-128
93	i-C_3H_7	H	H	3-I	2-F-4-OCF_3	220-222
94	i-C_3H_7	H	H	3-I	2-C_2H_5-4-OCF_3	241-243
95	t-C_4H_9	H	H	3-I	2-C_2H_5-4-OCF_3	224-225
96	i-C_3H_7	H	H	3-Cl-4-F	2-CH_3-4-OCF_3	184-186
97	i-C_3H_7	H	H	3-Cl-4-F	2-CH_3-4-$CF(CF_3)_2$	200-201
98	i-C_3H_7	H	H	5-I	2-CH_3-4-OCF_2CHF_2	203-204
99	i-C_3H_7	H	H	4-I	2-CH_3-4-$CF(CF_3)_2$	215-216
100	i-C_3H_7	H	H	3-I	2-CH_3-4-C≡C-C_4H_9-t	205
101	i-C_3H_7	H	H	3-Cl	2-CH_3-4-CN	230
102	i-C_3H_7	H	H	3-I	2-F-4-C_2F_5	190
103	i-C_3H_7	H	H	3-I	2-Cl-4-C_2F_5	200
104	i-C_3H_7	H	H	3-I	2-CF_3-4-C_2F_5	255
105	i-C_3H_7	H	H	3-I	2-OCH_3-4-C_2F_5	152
106	2-TetFur	H	H	3-Cl	2-CH_3-4-C_2F_5	153
107	2-TetFur	H	H	6-Cl	2-CH_3-4-C_2F_5	130
108	CH_2-4-Pyi	H	H	3-Cl	2-CH_3-4-C_2F_5	88
109	CH_2-4-Pyi	H	H	6-Cl	2-CH_3-4-C_2F_5	Paste
110	i-C_3H_7	H	H	3-I	2-C_2F_5-4-C_2F_5	245
111	i-C_3H_7	H	H	H	4-O-(2-Pym)	246
112	$C(CH_3)_2CH_2CH_3$	H	H	3-I	2-CH_3-4-C_2F_5	193
113	$C(CH_3)_2CH_2CH_3$	H	H	3-I	2-CH_3-4-OCF_3	180
114	$C(CH_3)_2CH_2CH_3$	H	H	3-I	2-CH_3-4-$OCHF_2$	176-177
115	i-C_3H_7	H	H	3-I	2-Cl-4-OCF_2O-5	226
116	i-C_3H_7	H	H	3-I	2-Cl-3-OCF_2CF_2O-4	219
117	$C(CH_3)_2CH_2Cl$	H	H	3-I	2-CH_3-4-C_2F_5	168-169
118	i-C_3H_7	H	H	3-I	4-(2-CH_3-4-Thz)	217
119	i-C_3H_7	H	H	3-I	4-(2-CH_3-4-Oxa)	212
120	i-C_3H_7	H	H	3-I	4-(2-i-C_3H_7-4-Thz)	199
121	$CH(CH_3)$-2-Pyi	H	H	3-I	2-CH_3-4-OCF_3	158-161
122	N(Ph)$COCF_3$	H	H	3-I	2-CH_3-4-C_2F_5	239-241
123	$CH(CH_3)$-2-Fur	H	H	3-I	2-CH_3-4-C_3F_7-i	191

Table 1 (continued)

(Z^1 =Z^2 =O)						
No	R^1	R^2	R^3	Xn	Ym	Property mp °C
124	$CH(CH_3)$-2-Thi	H	H	3-I	2-CH_3-4-C_3F_7-i	159
125	i-C_3H_7	H	H	3-CF_3SO	2-CH_3-4-C_3F_7-i	211-213
126	t-C_4H_9	H	H	3-I	2-N=$C(CF_3)$O-3	120
127	i-C_3H_7	H	H	3-I	2-CH_3-4-$C(CH_3)$=$NOCH_3$	218
128	t-C_4H_9	H	H	6-CF_3S	2-CH_3-4-C_3F_7-i	245-247
129	$C(CH_3)_2CH_2SCH_3$	H	H	3-I	2-CH_3-4-C_3F_7-i	205-206
130	$C(CH_3)_2CH_2SO_2CH_3$	H	H	3-I	2-CH_3-4-C_3F_7-i	90-95
131	$C(CH_3)_2CH_2SOCH_3$	H	H	3-I	2-CH_3-4-C_3F_7-i	88-90
132	$CH(CH_3)CH_2SCH_3$	H	H	3-I	2-CH_3-4-C_3F_7-i	197-199
133	$CH(CH_3)CH_2SO_2CH_3$	H	H	3-I	2-CH_3-4-C_3F_7-i	82
134	$CH(CH_3)CH_2SOCH_3$	H	H	3-I	2-CH_3-4-C_3F_7-i	134
135	$C(CH_3)_2CH_2SCH_3$	H	H	3-I	2-Cl-4-OCF_3	166
136	$C(CH_3)_2CH_2SO_2CH_3$	H	H	3-I	2-Cl-4-OCF_3	141
137	$C(CH_3)_2CH_2SO_2CH_3$	H	H	3-Br	2-Cl-4-OCF_3	133
138	$C(CH_3)_2CH_2SC_2H_5$	H	H	3-I	2-CH_3-4-C_2F_5	188-189
139	$C(CH_3)_2CH_2SO_2C_2H_5$	H	H	3-I	2-CH_3-4-C_2F_5	120-122
140	$C(CH_3)_2CH_2SOC_2H_5$	H	H	3-I	2-CH_3-4-C_2F_5	125-126
141	$C(CH_3)_2CH_2SCH_3$	H	H	3-Cl	2-CH_3-4-C_3F_7-i	199-200
142	$CH(CH_3)CH_2SCH_3$	H	H	3-I	2-Cl-4-C_3F_7-i	190

[0016] In Table 1, "Ph" means a phenyl group, "c" means an alicyclic hydrocarbon group, "Pyi" means a pyridyl group, "Pym" means a pyrimidinyl group, "Fur" means a furyl group, "TetFur" means a tetrahydrofuryl group, "Thi" means a thienyl group, "Thz" means a thiazolyl group, and "Oxa" means an oxazolyl group.

[0017] As the compounds having an insecticidal, 'acaricidal or nematocidal activity, which the composition for noxious organisms-controlling agent of the present invention comprises, insecticidal compounds such as chloronicotinyl compounds, carbamate compounds, pyrethroid compounds, macrolide compounds, phosphorus compounds and the like can be referred to. Examples thereof include the following compounds indicated by their general names, however, the present invention is by no means limited by these compounds:

acetamiprid, pymetrozine, fenitrothion, acephate, carbaryl, methomyl, cartap, cyhalothrin, ethofenprox, teflubenzuron, flufenoxuron, tebufenozide, fenpyroximate, pyridaben, imidacloprid, buprofezin, BPMC (fenobucarb), malathion, methidathion, fenthion, diazinon, oxydeprofos, vamidothion, ethiophencarb, pirimicarb, permethrin, cypermethrin, bifenthrin, halfenprox, silafluofen, nitenpyram, chlorfluazuron, methoxyfenozide, tebufenpyrad, pyrimidifen, dicofol, propargite, hexythiazox, clofentezine, spinosad, milbemectin, BT (bacillus thuringiensis), indoxacarb, chlorfenapyr, fipronil, etoxazole, acequinocyl, pirimiphos-methyl, acrinathrin, quinomethionate, chlorpyrifos, avermectin, emamectin-benzoate, fenbutatin oxide, terbufos, ethoprophos, cadusafos, fenamiphos, fensulfothion, DSP, dichlofenthion, fosthiazate, oxamyl, isamidofos, fosthietan, isazofos, thionazin, benfuracarb, spirodiclofen, ethiofencarb, azinphos-methyl, disulfoton, methiocarb, oxydemeton-methyl, parathion, cyfluthrin, beta-cyfluthrin, tebupyrimfos, spiromesifen, endosulfan, amitraz, tralomethrin, acetoprole, ethiprole and the like.

[0018] Further, it is also possible to use the compounds mentioned above in combination with insecticides, acaricides and nematocides having the following general names or chemical names, or those disclosed in the following Patent Kokai gazettes, etc.:

ethion, trichlorfon (DEP), metamidophos, dichlorvos (DDVP), mevinphos, monocrotophos, dimethoate, formothion, mecarbam, thiometon, disulfoton, naled (BRP), methylparathion, cyanophos, diamodafos, albendazole, oxibendazole, fenbendazole, oxfendazole, propaphos, sulprofos, prothiofos, profenofos, isophenphos, temephos, phenthoate, dimethylvinphos, chlorfenvinphos, tetrachlorvinphos, phoxim, isoxathion, pyraclofos, chlorpyrifos-methyl, pyridafenthion, phosalone, phosmet, dioxabenzofos, quinalphos, pyrethrins, allethrin, prallethrin, resmethrin, permethrin, tefluthrin, fenpropathrin, alpha-cypermethrin, lambda-cyhalothrin, deltamethrin, fenvalerate, esfenva-

lerate, flucythrinate, fluvalinate, cycloprothrin, thiodicarb, aldicarb, alanycarb, metolcarb, xylylcarb, propoxur, fenoxycarb, fenothiocarb, bifenazate, carbofuran, carbosulfan, furathiocarb, diafenthiuron, diflubenzuron, hexaflumuron, novaluron, lufenuron, chlorfluazuron, cyhexatin, Oleic acid sodium salt, Potassium oleate, methoprene, hydroprene, binapacryl, amitraz, chlorobenzilate, brompropylate, tetradifon, bensultap, benzoximate, chromafenozide, endosulfan, diofenolan, tolfenpyrad, triazamate, nicotine-sulfate, thiacloprid, thiamethoxam, clothianidin, dinotefuran (MT I-446), fluazinam, pyriproxyfen, hydramethylnon, cyromazine, TPIC (tripropylisocyanurate), thiocyclam, fenazaquin, polynactins, azadirachtin, rotenone, Hydroxy propyl starch, mesulfenfos, phosphocarb, isoamidofos, aldoxycarb, metam-sodium, morantel tartrate, dazomet, levamisol, trichlamide, pyridalyl, 2-[2-(4-cyanophenyl)-1-(3-trifluoromethylphenyl)-ethylidene]-N-(4-trifluoromethoxyphenyl)hydrazine carboxamide and its E isomer, its Z isomer, and mixtures of E and Z isomers at arbitrary mixing ratios, and the substituted aminoquinazolinone (thion) derivatives or salts thereof disclosed in JP-A-8-325239 and Japanese Patent Application 2000-334700, etc.

[0019] When the phthalamide derivative specified by the present invention is combined with the second active ingredient of the present invention, namely one or more compounds selected from the compounds having an insecticidal, acaricidal or nematocidal activity and the composition thus obtained is used as a composition for noxious organisms-controlling agent, the amount of the active ingredient compounds in 100 parts by weight of the composition may be appropriately selected from a range of 0.1-50 parts by weight and preferably 1-20 parts by weight. In the active ingredient compounds, the ratio between the specified phthalamide and the one or more compounds selected from the compounds having an insecticidal, acaricidal or nematocidal activity may be appropriately selected from a range of 0.05-2,000 parts by weight and preferably 10-100 parts by weight of the one or more compounds having an insecticidal, acaricidal or nematocidal activity, per one part by weight of the specified phthalamide derivative.

[0020] When the composition for noxious organisms-controlling agent of the present invention is put to use, the composition is used in an appropriate solid, liquid or powdery form prepared according to the conventional method in the pesticide making. According to the need, adjuvants and the like are added to the composition at an appropriate ratio. The mixture is subjected to melting, suspending, mixing, impregnation, adsorption or adhesion, and then formed into an appropriate preparation form such as emulsion, powder, granule, wettable powder, flowable composition, etc. according to the purpose, and put to use.

[0021] The composition for noxious organisms-controlling agent of the present invention is suitable for controlling various agricultural, forestry and horticultural pests making harm to paddyfield rice plants, vegetables, fruit plants, flowers and ornamental plants and the like; pests making injury on stored grain; sanitary insect pests; nematodes, etc. As examples of the pests, the following can be referred to:

pests belonging to HETEROPTERA of HEMIPTERA such as plataspid bug (Megacopta punctatissimum), whitespotted larger spined bug (Eysarcoris lewisi), whitespotted bug (Eysarcoris parvus), southern green stink bug (Nezara viridula), brownwinged green bug (Plautia stali), narrow squash bug (Cletus puctiger), rice bug (Leptocorisa chinensis), bean bug (Riptortus clavatus), rice leaf bug (Togo hemipterus), pear lace bug (Stephanitis nashi), azelea lace bug (Stephanitis pyrioides), pale green plant bug (Apolygus spinolai), sorghum plant bug (Stenotus rubrovittalus), rice leaf bug (Trigonotylus coelestialium), etc.;

pests belonging to HOMOPTERA such as grape leafhopper (Arboridia apicalis), tea green leafhopper (Empoasca onukii), green rice leafhopper (Nephotettix cincticeps), green rice leafhopper (Nephotettix virescens), small brown planthopper (Laodelphax striatellus), brown rice planthopper (Nilaparvata lugens), whitebacked rice planthopper (Sogatella furcifera), citrus psylla (Diaphorina citri), citrus spiny whitefly (Aleurocanthus spiniferus), silver leaf whitefly (Bemisia argentifolli), sweetpotato whitefly (Bemisia tabaci), citrus whitefly (Dialeurodes citri), greenhouse whitefly (Trialeurodes vaporariorum), grapeleaf louse (Viteus vitifolli), woolly apple aphid (Eriosoma lanigerum), spiraea aphid (Aphis citricola), cowpea aphid (Aphis craccivora), cotton aphid (Aphis gossipii), greenhouse-potato aphid (Aulacorthum solani), cabbage aphid (Brevicoryne brassicae), potato aphid (Macrosiphum euphorbiae), green peach aphid (Myzus persicae), oat bird-cherry aphid (Rhopalosiphum padi), japanese grain aphid (Sitobion akebiae), comstock mealybug (Pseudococcus comstocki), Inidan wax scale (Ceroplastes ceriferus), red scale (Aonidiella aurantii), San Jose scale (Comstockaphis perniciosa), mulberry scale (Pseudaulacapsis pentagoa), arrowed-head scale (Unaspis yanonensis), etc.;

pests belonging to LEOPIDOPTERA such as summer fruit fortrix (Adoxophyes orana fasciata), smaller tea tortrix (Adoxophyes honmai), apple tortrix (Archips fuscocupreanus), peach fruit moth (Carposina niponensis), oriental fruit moth (Grapholita molesta), oriental tea tortrix (Homona magnanima), tea leafroller (Caloptilia theivora), mugwort looper (Ascotis selenaria), grape berry moth (Endopiza viteana), codling moth (Laspeyresia pomonella), apple leafminer (Phyllonorycter ringoniella), apple leaf miner (Lyonetia prunifoliella malinella), citrus leafminer (Phyllocnistis citrella), diamondback moth (Plutella xylostella), pink bollworm (Pectinophora gossypiella), peach fruit moth (Carposina niponensis), rice stem borer (Chilo supperssalis), yellow rice borer (Scirpophaga incertulas), rice leafroller (Cnaphalocrosis medinalis), cabbage webworm (Hellulla undalis), Chinese yellow swallowtail (Papilio

xuthus), common white (Pieris rapae crucivora), tent catapillar (Malacosoma neustria testacea), fall webworm (Hyphantria cunea), bluegrass webworm (Parapediasia tererrella), corn earworm (Helicoverpa armigera), Heliothis (Heliothis spp.), cutworm (Agrotis segetum), beet semi-looper (Autographa nigrisigna), cabbage armyworm (Mamestra brassicae), beat armyworm (Spodoptera exigua), common cutworm (Spodoptera litura), etc.;
pests belonging to COLEOPTERA such as cupreous chafer (Anomala cuprea), Japanese beetle (Popillia japonica), powderpost beetle (Lyctus brunneus), confused flour beetle (Tribolium confusum), twenty-eight-spotted ladybird (Epilachna vigintioctopunctata), whitespotted longicorn beetle (Anoplophora malasiaca), Japanese pine sawyer (Monochamus alteratus), azuki bean weevil (Callosobruchus chinensis), cucurbit leaf beetle (Aulacophora femoralis), rootworm (Diabrotica spp.), boll weevil (Anthonomus grandis grandis), Mexican beetle (Epilachna varivestis), Colorado leaf beetle (Leptinotarsa decemlineata), rice water weevil (Lissorhoptrus oryzophylus), rice leaf beetle (Oulema oryzae), hunting billbug (Sphenophrus venatus vestitus), etc.;
pests belonging to HYMENOPTERA such as cabbage sawfly (Athalia rosae ruficornis), rose argid sawfly (Arge pagana), Formica japonica, etc.;
pests belonging to DIPTERA such as rice leafminer (Agromyza oryzae), rice leafminer (Hydrellia griseola), legume leafminer (Liriomyza trifolii), onion maggot (Delia antiqua), house fly (Musca domestica), Culex pipiens molestus, house mosquito (Culex pipiens pallens), etc.;
pests belonging to THYSANOPTERA such as yellow tea thrips (Scirtothrips dorsalis), southern yellow thrips (Thrips palmi), onion thrips (Thrips tabaci), cirtus yellow thrips (Frankliniella occidentalis), etc.;
pests belonging to ISOPTERA such as Formosan subterranean termites (Coptotermes formosanus), japanese subterranean termite (Reticulitermes speratus), booklice (Psocoptera), Liposcelis bostrychophilus, etc.;
pests belonging to ORTHOPTERA such as rice grasshopper (Oxya yezoensis), mole crichet (Gryllotalpa sp.), American cockroach (Periplaneta americana), German cockroach (Blattella germanica), etc.;
pests belonging to ACARINA such as citrus red mite (Panonychus citri), fruit tree red spider mite (Panonychus ulmi), two-spotted spider mite (Tetranychus urticae), Kanzawa spider mite (Tetranychus kanzawai), southern false spider mite (Brevipalpus phoenicis), clover mite (Bryobia praetiosa), pink citrus rust mite (Aculops pelekassi), japanese pear rust mite (Eriophyes chibaensis), broad mite (Polyphagotarsonemus latus), bulb mite (Rhizoglyphus robini), mold mite (Tyrophagus putrescentiae), etc.;
pests belonging to TYLENCHIDA such as coffee root-lesion nematode (Pratylenchus coffeae), Cobb root-lesion nematode (Pratylenchus penetrans), potato cyst nematode (Globodera rostochiensis), southern root-knot nematode (Meloidogyne incognita), etc.;
pests belonging to DOLYLAMIDA such as needle nematode (Longidorus sp.), etc.; and
pests belonging to GASTRPODA such as slug (Incilaria bilineata), etc.

[0022] The useful plants to which the composition for noxious organisms-controlling agent of the present invention can be applied are not particularly limited, and the following plants can be referred to as examples thereof:

cereals such as rice, barley, wheat, rye, oat, corn, etc.; beans and peas such as soybean, red bean, broad bean, pea, kidney-bean, peanut, etc.; fruit trees such as apple, citrus trees and fruits, pear, grape, peach, plum, cherry, walnut, chestnut, almond, banana, strawberry, etc.; leafy and fruit vegetables such as cabbage, tomato, spinach, broccoli, lettuce, onion, stone-leek, Spanish paprika, egg-plant, pepper, etc.; root crops such as carrot, potato, sweet potato, taro, radish, lotus rhizome, turnip, burdock, garlic, etc.; processing crops such as cotton, flax, beet, hop, sugar can, sugar beet, olive, gum, coffee, tobacco, tea, etc.; cucurbitaceous plants such as pumpkin, cucumber, musk melon, water melon, melon, etc.; pasture plants such as orchard grass, sorghum, timothy, clover, alfalfa, etc.; lawn grasses such as mascarenegrass, bent grass, etc.; perfumery crops such as lavender, rosemary, thyme, parsley, pepper, ginger, etc.; flowers and ornamental plants such as chrysanthemum, rose, carnation, orchid, etc.; garden-trees such as ginkgo tree, cherry tree, gold-leaf plant, etc.; and timber woods such as white fir, silver fir, pine, hatchet-leaved arbor-vitae, Japan cedar, Japanese eypress, etc.

[0023] In order to control various disease pests, the composition for noxious organisms-controlling agent of the present invention is applied to the plants on which appearance of the noxious organisms is expected, either as it is or in the form of a dilution or suspension in a proper quantity of water or the like at a dosage effective for the control of the noxious organisms. For instance, with the aim of controlling the appearance of noxious organisms on fruit trees, cereals and vegetables, the composition may be directly used for foliage treatment, or the composition may also be used for seed treatments such as immersion of seeds in the agent solution, seed coating, calper treatment or the like, or absorption from the root by soil treatment or the like, such as incorporation into total soil layer, row treatment, soil incorporation, cell seedling treatment, prickling-in-hole treatment, plant foot treatment, top dressing, nursery box application of rice, submerged application, etc. In addition, application of the composition to the nutrient solution in the water culture, the use by fumigation, and the injection into tree stalks, etc. are also usable.

[0024] Further, apart from the spraying treatment on stored grain pests, house pests, sanitary insect pests and forest pests, application to construction material of house, fumigation, bait, etc. are also adoptable.

[0025] As the method of treating seeds, a method of dipping seeds in a diluted or undiluted liquid preparation of the liquid or solid composition and thereby making the agent permeate into the seeds; a method of mixing a solid or liquid preparation with seeds for the sake of powder coating and thereby making the agent adhere to the seed surface; a method of mixing the preparation with an adhesive carrier such as resin, polymer or the like and coating seeds with such an adhesive mixture; a method of spraying the preparation to the neighborhood of seeds simultaneously with planting, etc. can be referred to.

[0026] The term "seed" to be treated with the composition of the present invention means a plant body of the initial stage of cultivation used for reproduction of plants, and involves not only the seeds but also plant bodies for nutrient reproduction such as bulb, tuber, seed tuber, aerial tuber, scaly bulb, stalks for cuttage, and the like.

[0027] The term "soil" or "cultivation carrier" for plants in the practice of the using method of the present invention means a support for use in culture of a plant and especially a support in which roots are to be grown. They are not limited in material quality, but any material may be used so far as a plant can be grown therein. For instance, so-called various soils, nursery mat, water and the like can be used. Specific examples of the material constituting the soil or cultivation carrier include sand, pumice, vermiculite, diatomaceous earth, agar, gelatinous materials, polymeric materials, rock wool, glass wool, wood chips, bark and the like.

[0028] As method for spraying the composition to foliage part of crops or stored grain pest, sanitary insect pest, forest pest, etc., a method of diluting a liquid preparation such as emulsifiable concentrate, flowable agent and the like or a solid preparation such as wettable preparation, granular wettable preparation and the like with water properly and spraying the dilution, a method of spraying a powdery composition, a method of fumigation, etc. can be referred to.

[0029] As method for applying the composition to the soil, a method of applying a liquid preparation either diluted or undiluted with water to the plant foot, nursery bed for raising seedlings or the like, a method of spraying a granular agent to the plant foot or nursery bed, a method of spraying a dust, a wettable powder, a wettable granule or a granular agent to the soil and mixing it with the whole soil either before seeding or before transplantation, a method of spraying a dust, a wettable powder, a wettable granule, a granular agent or the like to planting holes, planting rows, etc. can be referred to.

[0030] As method for applying the composition to a nursery box of paddyfield rice, a method of applying the composition in the form of dust, granular wettable powder, granule, etc. can be referred to, though the preparation form may vary depending on the time of application, namely whether the application is carried out in sowing period, greening period or transplanting period. It is also possible to apply the composition in the form of a mixture with soil, as in the form of mixture of soil and a dust, a granular wettable powder or a granule, according to a method of mixing into bed soil, covering soil, or the whole soil. It is also possible to apply the composition by merely making the soil and various preparations into layers.

[0031] For applying the composition of the present invention to a paddy field, a solid preparation such as jumbo-pack, granule, wettable granule, and the like or a liquid preparation such as flowable, emulsifiable concentrate and the like is scattered to a paddy field usually in a submerged state. Otherwise, it is also possible to scatter or inject an appropriate agent as it is or in the form of a mixture with fertilizers into soil at the time of transplantation. It is further possible to apply an emulsifiable concentrate to the water inlet or water flow source of irrigating system, by which the composition can be applied together with water supplied to the paddy field in a labor-saving manner.

[0032] In case of upland field crops, the composition of the present invention may be applied to the cultivation carrier surrounding the seeds or plant bodies in the period from the seeding to the seedling raising. In cases where plant seeds are directly sown to the field, the composition may directly be applied to seeds to make a seed coating, or may also be applied to the base of hills in the course of cultivation to achieve a successful result. It is also possible to scatter a granular preparation or to apply a liquid preparation after dilution with water or without dilution. Another preferable treatment is to mix a granular preparation with a cultivation carrier before seeding and to sow seeds thereafter.

[0033] In cases where cultured plants to be transplanted are treated at the seeding time or in the seedling raising period, it is preferable to treat the seeds directly, or to carry out an irrigating treatment of a seedling raising bed with a liquefied agent, or to carry out a powdering treatment thereof with a granular agent. Further, it is also preferable to apply a granular agent to the planting holes at the time of set-planting or to mix the agent into the cultivation carrier in the neighborhood of the sites of transplantation.

[0034] The composition for noxious organisms-controlling agent of the present invention may be put to use after forming it into a usual preparation form, such as emulsifiable concentrate, wettable powder, granular wettable powder, flowable preparation, solution, granule, dust, fumigant and the like. Although the dosage thereof varies depending on the content of active ingredient in the composition, climate conditions, preparation form, method of application, place of application, objective noxious organism to be controlled, objective crop plant, etc. The dosage may be appropriately selected from a range of 0.1 gram to 1,000 grams and preferably 1 gram to 500 grams in terms of weight of active ingredient, per are of the field. In the case of seed treatment, it is possible to use the composition in an amount of

0.01-50% and preferably in an amount of 0.1-10% in terms of weight of active ingredient, based on the weight of seed. In cases where an emulsifiable concentrate or a wettable powder is diluted with water and then put to use, the concentration at the time of application is 0.00001-0.1%. In the cases of a granular preparation, a dust, and a liquid composition to be applied to seeds, the composition is directly applied without dilution, usually.

[0035] For the purpose of controlling the diseases and/or the weeds which appear simultaneously with the time of the application of the composition for noxious organisms-controlling agent of the present invention, the second active ingredient of the present invention, namely the compound having an insecticidal, acaricidal or nematocidal activity, may be replaced with a compound having a fungicidal or herbicidal activity. By taking such a measure, the span of objective disease and pests to be controlled can be expanded and the dosage can be reduced, and the herbicidal effect can be increased synergistically. The same effect as above can be expected also by adding a compound having a fungicidal or herbicidal activity to the composition for noxious organisms-controlling agent of the present invention and putting the mixture thus obtained to use.

[0036] As said compound having a fungicidal or herbicidal activity, the following can be referred to.

[0037] Thus, examples of the compound having a fungicidal activity include azoxystrobin, diclocymet, pyroquilon, kasugamycin, IBP (iprobenfos), hymexazol, mepronil, tricyclazole, edifenphos, isoprothiolane, blasticidin, flutolanil, diclomezine, pencycuron, carbendazim, dodine, propamocarb, pyrimethanil, fluquinconazole, fosetyl-AL, bromuconazole, triticonazole, flumetover, fenamidone, tolylfluanid, dichlofluanid, trifloxystrobin, triadimenol, spiroxamine, fenhexamid, iprovalicarb, fthalide, iprodione, thiophanate, benomyl, triflumizole, fluazinam, zineb, captan, manzeb, fenarimol, calcium polysulfide, triadimefon, vinclozolin, dithianon, bitertanol, polycarbamate, iminoctadine-DBS, pebulate, polyoxin-B, propineb, chinomethionat, dichlofluanid, chlorothalonil, difenoconazole, fluoroimide, triforine, oxadixyl, streptomycin, mancozeb, oxolinic acid, mepronil, metalaxyl, propiconazole, hexaconazole, sulfur, pyrifenox, basic copper sulfate, pyrimethanil, iprobenfos, tolclofos-methyl, maneb, thiophanate-methyl, thifluzamide, furametpyr, flusulfamide, kresoxim-methyl, carpropamid, hydroxyisoxazole, echlomezole, procymidone, vinclozolin, ipconazole, furconazole, myclobutanil, tetraconazole, tebuconazole, imibenconazole, prochloraz, pefurazoate, cyproconazole, mepanipyrim, thiadiazin, probenazole, acibenzolar-S-methyl, validamycin(-A), fenoxanil, N-(3-chloro-4-methylphenyl)-4-methyl-1,2,3-thiadiazole-5-carboxamide, etc.

[0038] Examples of the compound having a herbicidal activity include bensulfuron-methyl, azimsulfuron, cinosulfuron, cyclosulfamuron, pyrazosulfuron-ethyl, imazosulfuron, indanofan, cyhalofop-butyl, thenylchlor, esprocarb, etobenzanid, cafenstrole, clomeprop, dimethametryn, daimuron, bifenox, pyributicarb, pyriminobac-methyl, pretilachlor, bromobutide, benzofenap, benthiocarb, bentoxazone, benfuresate, mefenacet, fenoxaprop-P-ethyl, phenmedipham, diclofop-methyl, desmedipham, ethofumesate, isoproturon, amidosulfuron, anilofos, ethoxysulfuron, iodosulfuron, isoxadifen, foramsulfuron, pyraclonil, mesosulfuron, diuron, neburon, dinoterb, carbetamide, bromoxynil, oxadiazon, dimefuron, diflufenican, aclonifen, benzofenap, oxaziclomefone, isoxaflutole, oxadiargyl, flurtamone, metribuzin, methabenzthiazuron, tribufos, metamitron, ethiozin, flufenacet, sulcotrion, fentrazamide, propoxycarbazone, flucarbazone, metosulam, amicarbazone, etc.

[0039] Further, it is also possible to mix the herbicides expressed by the following general names into the composition of this invention:

glyphosate-isopropyl amine, glyphosate-trimesium, glufosinate-ammonium, bialaphos, butamifos, prosulfocarb, asulam, linuron, calcium peroxide, alachlor, pendimethalin, acifluofen-sodium, lactofen, ioxynil-octanoate, alloxydim, sethoxydim, napropamide, pyrazolate, pyraflufen-ethyl, imazapyr, sulfentrazone, oxadiazon, paraquat, diquat, simazine, atrazine, fluthiacet-methyl, quizalofop-ethyl, bentazone (BAS-3510-H), triaziflam, etc.

[0040] Further, the composition of the present invention can be used in the form of a mixture with the following compounds having a plant growth regulating activity:

thidiazuron, mefenpyr, ethephon, cyclanilide, etc.

[0041] The composition of this invention can be used as a mixture with the following biotic pesticides to exhibit a similar effect:

viral preparations such as Nuclear polyhedrosis virus (NPV), Granulosis virus (GV), Cytoplastic polyhedrosis virus (CPV), Entomopox virus (EPV), etc.:

microbial pesticides used as insecticide or nematocide such as Monacrosporium phymatophagum, Steinernema caprocapsae, Steinernema kushidai, Pasteuria penetrans, etc.;
microbial pesticides used as fungicide such as Trichoderma lignorum, Agrobacterium radiobactor, Erwinia carotovora, Bacillus subtilis, monacrosporium•phamatophagum etc.; and

microial pesticides used as herbicide such as Xanthomonas capestris, etc.

[0042] Further, it is also possible to use the composition of the present invention in combination with the following biotic pesticides:

natural enemy organisms such as Parasitic wasp (Encarsia formosa), Parasitic wasp (Aphidius colemani), Gallmildge (Aphidoletes aphidimyza), Parasitic wasp (Diglyphus isaea), Parasitic mite (Dacnusa sibirica), Predatory mite (Phytoseiulus persimilis), Predatory mite (Amblyseius cucumeris), Predatory bug (Orius sauteri), etc.; microbial pesticides such as Beauveria brongniartii), etc.; and pheromones such as (Z)-10-tetradecenyl=acetate, (E,Z)-4,10-tetradecadienyl=acetate, (Z)-8-dodecenyl=acetate, (Z)-11-tetradecenyl=acetate, (Z)-13-icosen-10-one, (Z)-8-dodecenyl=acetate, (Z)-11-tetradecenyl=acetate, (Z)-13-icosen-10-one, 14-methyl-1-octadecene, etc.

EXAMPLES

[0043] Next, typical examples and test examples of the present invention are mentioned below. This invention is by no means limited by these examples. In the examples, the terms "part" and "parts" are both by weight.

Example 1

[0044]

Compound of Table 1	5 parts
Fenpyroximate	10 parts
Silicic acid hydrate	30 parts
Hitenol N-08 (manufactured by Daiichi Kogyo Seiyaku)	5 parts
Calcium ligninsulfonate	3 parts
Wettable clay	47 parts

[0045] After impregnating silicic acid hydrate with the active ingredient compounds, the silicic acid hydrate is uniformly blended with other ingredients to form a wettable powder composition.

Example 2

[0046]

Compound of Table 1	10 parts
Tebufenpyrad	10 parts
Sorpol 3105 (manufactured by Toho Yakuhin Kogyo)	5 parts
Propylene glycol	5 parts
Rhodopol (manufactured by Rohne Poulenc Inc.)	2 parts
Water	68 parts

[0047] The above-mentioned ingredients are uniformly mixed together and dispersed in water to form a flowable preparation.

Example 3

[0048]

Compound of Table 1	10 parts
Isoprothiolane	20 parts

(continued)

SP-3005X (manufactured by Toho Kagaku)	15 parts
Xylene	35 parts
N-Methylpyrrolidone	20 parts

[0049] The above-mentioned ingredients are uniformly mixed and melted to form an emulsifiable concentrate.

Example 4

[0050]

Compound of Table 1	10 parts
Tebufenozide	20 parts
Sorpol 3105	5 parts
Propylene glycol	2 parts
Rhodopol 23	1 part
Water	62 parts

[0051] The above-mentioned ingredients are uniformly mixed together and dispersed in water to form a flowable preparation.

Example 5

[0052]

Compound of Table 1	10 parts
Buprofezin	5 parts
Silicic acid hydrate	34 parts
Hitenol N-08	3 parts
Demol T	2 parts
Calcium carbonate powder	46 parts

[0053] After impregnating silicic acid hydrate with the active ingredient compounds, the silicic acid hydrate is uniformly blended with other ingredients to form a wettable powder composition.

Example 6

[0054]

Compound of Table 1	10 parts
Pyridaben	15 parts
SP-3005X	15 parts
Xylene	40 parts
N-Methylpyrrolidone	20 parts

[0055] The above-mentioned ingredients are uniformly mixed together and melted to form an emulsifiable concentrate.

Example 7

[0056]

Compound of Table 1	10 parts

(continued)

Pyraflufen-ethyl	20 parts
Sorpol 3105	5 parts
Propylene glycol	2 parts
Rhodopol 23	0.5 part
Water	62.5 parts

[0057] The above-mentioned ingredients are uniformly mixed together and dispersed in water to form a flowable preparation.

Example 8

[0058]

Compound of Table 1	10 parts
Acetamiprid	5 parts
Sorpol 3105	5 parts
Propylene glycol	3 parts
Rhodopol	2 parts
Water	75 parts

[0059] The above-mentioned ingredients are uniformly mixed together and dispersed in water to form a flowable preparation.

Example 9

[0060]

Compound of Table 1	10 parts
Imidacloprid	10 parts
SP-3005X	15 parts
Xylene	45 parts
N-Methylpyrrolidone	20 parts

[0061] The above-mentioned ingredients are uniformly mixed together and melted to form an emulsifiable concentrate.

Example 10

[0062]

Compound of Table 1	5 parts
Chlorfenapyr	10 parts
Sorpol 3105	5 parts
Propylene glycol	3 parts
Rhodopol 23	2 parts
Water	75 parts

[0063] The above-mentioned ingredients are uniformly mixed together and dispersed in water to form a flowable preparation.

Example 11

[0064]

Compound of Table 1	5 parts
Pymetrozine	10 parts
Sorpol 3105	5 parts
Propylene glycol	3 parts
Rhodopol 23	2 parts
Water	75 parts

[0065] The above-mentioned ingredients are uniformly mixed together and dispersed in water to form a flowable preparation.

Test Example 1: Insecticidal test on smaller tea tortrix (Adoxophyes orana fosciota)

[0066] Tea leaves were dipped in a solution of a chemical diluted to a prescribed concentration for 30 seconds. After air-dryness, the leaves were transferred to a plastic dish having a diameter of 9 cm, inoculated with ten 4th instar larvae of smaller tea tortrix, and left to stand in a thermostatted chamber at 25°C. Four days and seven days after the treatment, the number of alive insects were counted, from which percentage of death was calculated. The test was carried out with two replications of 10 insects. The results are shown in Table 2.

Table 2

	Test agent	Concentration (ppm)	Death rate (%)	
			After 4 days	After 7 days
Compound 19	+chlorpyriphos	0.3+1	35	75
	+chlorfluazuron	0.3+1	35	95
	+chlorfenapyr	0.3+1	30	75
	+emamectin-benzoate	0.3+0.1	25	85
	+methoxyfenozide	0.3+0.1	75	95
	+indoxacarb	0.3+1	55	95
	+fenpyroximate	0.3+50	30	85
Compound 20	+chlorpyriphos	0.3+1	20	45
	+chlorfluazuron	0.3+1	25	85
	+chlorfenapyr	0.3+1	20	75
	+emamectin-benzoate	0.3+0.1	25	75
	+methoxyfenozide	0.3+0.1	45	85
	+indoxacarb	0.3+1	45	75
	+fenpyroximate	0.3+50	30	80
Compound 39	+chlorpyriphos	0.3+1	15	45
	+chlorfluazuron	0.3+1	20	75
	+chlorfenapyr	0.3+1	15	70
	+emamectin-benzoate	0.3+0.1	20	70
	+methoxyfenozide	0.3+0.1	40	80
	+indoxacarb	0.3+1	40	70
	+fenpyroximate	0.3+50	25	75
Compound 40	+chlorpyriphos	0.3+1	20	45
	+chlorfluazuron	0.3+1	25	80
	+chlorfenapyr	0.3+1	15	70
	+emamectin-benzoate	0.3+0.1	20	70
	+methoxyfenozide	0.3+0.1	35	85
	+indoxacarb	0.3+1	35	75

Table 2 (continued)

	Test agent	Concentration (ppm)	Death rate (%)	
			After 4 days	After 7 days
	+fenpyroximate	0.3+50	20	70
Compound 41	+chlorpyriphos	0.3+1	40	80
	+chlorfluazuron	0.3+1	35	95
	+chlorfenapyr	0.3+1	30	75
	+emamectin-benzoate	0.3+0.1	30	100
	+methoxyfenozide	0.3+0.1	75	95
	+indoxacarb	0.3+1	55	95
	+fenpyroximate	0.3+50	35	90
Compound 42	+chlorpyriphos	0.3+1	45	85
	+chlorfluazuron	0.3+1	35	100
	+chlorfenapyr	0.3+1	30	85
	+emamectin-benzoate	0.3+0.1	30	100
	+methoxyfenozide	0.3+0.1	75	95
	+indoxacarb	0.3+1	55	95
	+fenpyroximate	0.3+50	30	85
Compound 43	+chlorpyriphos	0.3+1	45	85
	+chlorfluazuron	0.3+1	35	95
	+chlorfenapyr	0.3+1	30	85
	+emamectin-benzoate	0.3+0.1	30	100
	+methoxyfenozide	0.3+0.1	75	95
	+indoxacarb	0.3+1	50	95
	+fenpyroximate	0.3+50	35	90
Compound 44	+chlorpyriphos	0.3+1	25	65
	+chlorfluazuron	0.3+1	30	85
	+chlorfenapyr	0.3+1	25	80
	+emamectin-benzoate	0.3+0.1	25	75
	+methoxyfenozide	0.3+0.1	45	90
	+indoxacarb	0.3+1	45	80
Compound 45	+chlorpyriphos	0.3+1	30	75
	+chlorfluazuron	0.3+1	25	90
	+chlorfenapyr	0.3+1	20	75
	+emamectin-benzoate	0.3+0.1	30	80
	+methoxyfenozide	0.3+0.1	35	85
	+indoxacarb	0.3+1	35	75
Compound 46	+chlorpyriphos	0.3+1	20	65
	+chlorfluazuron	0.3+1	35	80
	+chlorfenapyr	0.3+1	20	75
	+emamectin-benzoate	0.3+0.1	25	85
	+methoxyfenozide	0.3+0.1	35	85
	+indoxacarb	0.3+1	40	75
Compound 47	+chlorpyriphos	0.3+1	40	80
	+chlorfluazuron	0.3+1	40	95
	+chlorfenapyr	0.3+1	35	95
	+emamectin-benzoate	0.3+0.1	40	95
	+methoxyfenozide	0.3+0.1	75	100
	+indoxacarb	0.3+1	45	90
	+fenpyroximate	0.3+50	35	95

Table 2 (continued)

	Test agent	Concentration (ppm)	Death rate (%)	
			After 4 days	After 7 days
Compound 48	+chlorpyriphos	0.3+1	25	75
	+chlorfluazuron	0.3+1	35	85
	+chlorfenapyr	0.3+1	35	80
	+emamectin-benzoate	0.3+0.1	30	90
	+methoxyfenozide	0.3+0.1	40	75
	+indoxacarb	0.3+1	35	80
Compound 54	+chlorpyriphos	0.3+1	30	80
	+chlorfluazuron	0.3+1	25	85
	+chlorfenapyr	0.3+1	30	85
	+emamectin-benzoate	0.3+0.1	30	95
	+methoxyfenozide	0.3+0.1	35	80
	+indoxacarb	0.3+1	30	85
Compound 129	+chlorpyriphos	0.1+1	35	75
	+chlorfluazuron	0.1+1	35	95
	+chlorfenapyr	0.1+1	30	75
	+emamectin-benzoate	0.1+0.1	25	85
	+methoxyfenozide	0.1+0.1	75	95
	+indoxacarb	0.1+1	55	95
	+fenpyroximate	0.1+50	30	85
Compound 130	+chlorpyriphos	0.1+1	35	75
	+chlorfluazuron	0.1+1	35	95
	+chlorfenapyr	0.1+1	30	75
	+emamectin-benzoate	0.1+0.1	25	85
	+methoxyfenozide	0.1+0.1	75	95
	+indoxacarb	0.1+1	55	95
	+fenpyroximate	0.1+50	30	85
Compound 131	+chlorpyriphos	0.1+1	35	75
	+chlorfluazuron	0.1+1	35	95
	+chlorfenapyr	0.1+1	30	75
	+emamectin-benzoate	0.1+0.1	25	85
	+methoxyfenozide	0.1+0.1	75	95
	+indoxacarb	0.1+1	55	95
	+fenpyroximate	0.1+50	30	85
Compound 19		0.3	0	30
Compound 20		0.3	0	25
Compound 39		0.3	0	20
Compound 40		0.3	0	25
Compound 41		0.3	0	30
Compound 42		0.3	0	30
Compound 43		0.3	0	35
Compound 44		0.3	0	20
Compound 45		0.3	0	25
Compound 46		0.3	0	15
Compound 47		0.3	0	30
Compound 48		0.3	0	25
Compound 54		0.3	0	25
Compound 129		0.1	10	30

Table 2 (continued)

	Test agent	Concentration (ppm)	Death rate (%)	
			After 4 days	After 7 days
Compound 130		0.1	10	25
Compound 131		0.1	5	20
	chlorpyriphos	1	10	10
	chlorfluazuron	1	10	30
	chlorfenapyr	1	0	0
	emamectin-benzoate	0.1	10	45
	methoxyfenozide	0.1	0	50
	indoxacarb	1	10	40
	fenpyroximate	50	0	0
	Untreated plot	-	0	0

Test Example 2: Insecticidal test on green peach aphid (Myzus persicae)

[0067] Chinese cabbage plants (variety: Aichi) were planted in plastic pots having a diameter of 8 cm and a height of 8 cm, on which green peach aphids were inoculated. Then, a solution of an agent which had been diluted to a predetermined concentration was thoroughly sprayed to the leaves and stalks. After air-dryness, the pots were left to stand in a green house. Six days after the spraying treatment, the number of the insects parasitic on each Chinese cabbage plant was counted, from which the control value was calculated according to the following equation. The test was carried out with two replications on one pot per one plot.

$$\text{Controlling value} = 100 - \{(Ta \times Cb)/(Tb \times Ca)\} \times 100$$

Ta: Number of parasitic insects after spraying in the treated plot
Tb: Number of parasitic insects before spraying in the treated plot
Ca: Number of parasitic insects after spraying in the untreated plot
Cb: Number of parasitic insects before spraying in the untreated plot

[0068] The results are shown in Table 3.

Table 3

	Test agent	Concentration (ppm)	Control degree (%)
Compound 19	+Acephate	100+10	81
	+imidacloprid	100+0.1	100
	+bifenthrin	100+0.1	100
	+flufenoxuron	100+50	43
	+pyridaben	100+10	92
	+milbemectin	100+1	100
Compound 20	+Acephate	100+10	81
	+imidacloprid	100+0.1	100
	+bifenthrin	100+0.1	100
	+flufenoxuron	100+50	52
	+pyridaben	100+10	92
	+milbemectin	100+1	94
Compound 39	+Acephate	100+10	83
	+imidacloprid	100+0.1	97
	+bifenthrin	100+0.1	100
	+flufenoxuron	100+50	48

Table 3 (continued)

	Test agent	Concentration (ppm)	Control degree (%)
	+pyridaben	100+10	92
	+milbemectin	100+1	94
Compound 40	+Acephate	100+10	86
	+imidacloprid	100+0.1	100
	+bifenthrin	100+0.1	100
	+flufenoxuron	100+50	48
	+pyridaben	100+10	92
	+milbemectin	100+1	100
Compound 41	+Acephate	100+10	95
	+imidacloprid	100+0.1	100
	+bifenthrin	100+0.1	100
	+flufenoxuron	100+50	60
	+pyridaben	100+10	88
	+milbemectin	100+1	98
Compound 42	+Acephate	100+0	95
	+imidacloprid	100+0.1	100
	+bifenthrin	100+0.1	100
	+flufenoxuron	100+50	55
	+pyridaben	100+10	90
	+milbemectin	100+1	100
Compound 43	+Acephate	100+10	90
	+imidacloprid	100+0.1	95
	+bifenthrin	100+0.1	100
	+flufenoxuron	100+50	60
	+pyridaben	100+10	85
	+milbemectin	100+1	100
Compound 44	+Acephate	100+10	75
	+imidacloprid	100+0.1	80
	+bifenthrin	100+0.1	95
	+flufenoxuron	100+50	55
	+pyridaben	100+10	73
	+milbemectin	100+1	93
Compound 45	+Acephate	100+10	70
	+imidacloprid	100+0.1	78
	+bifenthrin	100+0.1	93
	+flufenoxuron	100+50	61
	+pyridaben	100+10	78
	+milbemectin	100+1	98
Compound 46	+Acephate	100+10	65
	+imidacloprid	100+0.1	75
	+bifenthrin	100+0.1	94
	+flufenoxuron	100+50	55
	+pyridaben	100+10	68
	+milbemectin	100+1	95
Compound 47	+Acephate	100+10	78
	+imidacloprid	100+0.1	88
	+bifenthrin	100+0.1	94
	+flufenoxuron	100+50	58
	+pyridaben	100+10	75

Table 3 (continued)

	Test agent	Concentration (ppm)	Control degree (%)
	+milbemectin	100+1	94
Compound 48	+Acephate	100+10	66
	+imidacloprid	100+0.1	93
	+bifenthrin	100+0.1	96
	+flufenoxuron	100+50	48
	+pyridaben	100+10	75
	+milbemectin	100+1	90
Compound 54	+Acephate	100+10	65
	+imidacloprid	100+0.1	92
	+bifenthrin	100+0.1	89
	+flufenoxuron	100+50	55
	+pyridaben	100+10	73
	+milbemectin	100+1	95
Compound 129	+Acephate	100+10	85
	+imidacloprid	100+0.1	100
	+bifenthrin	100+0.1	100
	+flufenoxuron	100+50	45
	+pyridaben	100+10	90
	+milbemectin	100+1	100
Compound 130	+Acephate	100+10	87
	+imidacloprid	100+0.1	100
	+bifenthrin	100+0.1	100
	+flufenoxuron	100+50	54
	+pyridaben	100+10	96
	+milbemectin	100+1	95
Compound 131	+Acephate	100+10	81
	+imidacloprid	100+0.1	99
	+bifenthrin	100+0.1	97
Compound 19		100	0
Compound 20		100	0
Compound 39		100	0
Compound 40		100	0
Compound 41		100	0
Compound 42		100	0
Compound 43		100	0
Compound 44		100	0
Compound 45		100	0
Compound 46		100	0
Compound 47		100	0
Compound 48		100	0
Compound 54		100	0
Compound 129		100	5
Compound 130		100	10
Compound 131		100	0
acephate		10	48
imidacloprid		0.1	69
bifenthrin		0.1	80
flufenoxuron		50	11

Table 3 (continued)

	Test agent	Concentration (ppm)	Control degree (%)
pyridaben		10	43
milbemectin		1	82

Test Example 3: Insecticidal test on brown rice planthopper (Nilaparvata lugens)

[0069] Rice seedlings (variety: Nihombare) were dipped in a solution of an agent diluted to a predetermined concentration for 30 seconds. After air-dryness, each seedling was introduced into a glass-made test tube having a diameter of 1.8 cm and a height of 20 cm, and inoculated with ten 3rd inster nimphs of brown rice planthopper. Then, the test tube was stoppered with cotton. One day after and four days after the treatment, the number of alive insects was counted, based on which the insect death rate was calculated. The test was carried out with two replications of 10 heads.

[0070] The results are shown in Table 4.

Table 4

	Test agent	Concentration (ppm)	Death rate (%)	
			After 1 days	After 5 days
Compound 19	+buprofezin	100+0.3	15	75
	+pymetrozin	100+100	20	85
	+silafluofen	100+1	95	100
	+imidacloprid	100+0.1	85	100
Compound 20	+buprofezin	100+0.3	10	80
	+pymetrozin	100+100	25	90
	+silafluofen	100+1	85	90
	+imidacloprid	100+0.1	65	95
Compound 39	+buprofezin	100+0.3	15	70
	+pymetrozin	100+100	30	85
	+silafluofen	100+1	85	85
	+imidacloprid	100+0.1	65	95
Compound 40	+buprofezin	100+0.3	20	75
	+pymetrozin	100+100	25	90
	+silafluofen	100+1	90	95
	+imidacloprid	100+0.1	75	95
Compound 41	+buprofezin	100+0.3	15	100
	+pymetrozin	100+100	30	90
	+silafluofen	100+1	85	95
	+imidacloprid	100+0.1	85	100
Compound 42	+buprofezin	100+0.3	25	100
	+pymetrozin	100+100	35	95
	+silafluofen	100+1	85	95
	+imidacloprid	100+0.1	90	100
Compound 43	+buprofezin	100+0.3	30	100
	+pymetrozin	100+100	40	95
	+silafluofen	100+1	90	100
	+imidacloprid	100+0.1	90	100
Compound 44	+buprofezin	100+0.3	15	95
	+pymetrozin	100+100	25	95
	+silafluofen	100+1	75	80
	+imidacloprid	100+0.1	80	95
Compound 45	+buprofezin	100+0.3	20	95

Table 4 (continued)

	Test agent	Concentration (ppm)	Death rate (%)	
			After 1 days	After 5 days
	+pymetrozin	100+100	30	100
	+silafluofen	100+1	80	80
	+imidacloprid	100+0.1	85	90
Compound 46	+buprofezin	100+0.3	15	80
	+pymetrozin	100+100	25	90
	+silafluofen	100+1	75	75
	+imidacloprid	100+0.1	70	75
Compound 47	+buprofezin	100+0.3	20	75
	+pymetrozin	100+100	30	85
	+silafluofen	100+1	65	70
	+imidacloprid	100+0.1	70	85
Compound 48	+buprofezin	100+0.3	25	85
	+pymetrozin	100+100	35	90
	+silafluofen	100+1	70	75
	+imidacloprid	100+0.1	75	80
Compound 54	+buprofezin	100+0.3	15	75
	+pymetrozin	100+100	30	75
	+silafluofen	100+1	65	65
	+imidacloprid	100+0.1	80	88
Compound 129	+buprofezin	100+0.3	15	80
	+pymetrozin	100+100	15	90
	+silafluofen	100+1	90	100
	+imidacloprid	100+0.1	85	100
Compound 130	+buprofezin	100+0.3	20	85
	+pymetrozin	100+100	25	90
	+silafluofen	100+1	90	95
	+imidacloprid	100+0.1	90	95
Compound 131	+buprofezin	100+0.3	25	85
	+pymetrozin	100+100	20	85
	+silafluofen	100+1	95	100
	+imidacloprid	100+0.1	85	100
Compound 19		100	0	0
Compound 20		100	0	0
Compound 39		100	0	0
Compound 40		100	0	0
Compound 41		100	0	0
Compound 42		100	0	0
Compound 43		100	0	0
Compound 44		100	0	0
Compound 45		100	0	0
Compound 46		100	0	0
Compound 47		100	0	0
Compound 48		100	0	0
Compound 54		100	0	0
Compound 129		100	0	0
Compound 130		100	0	0
Compound 131		100	0	0

Table 4 (continued)

	Test agent	Concentration (ppm)	Death rate (%)	
			After 1 days	After 5 days
buprofezin		0.3	0	45
pymetrozin		100	10	40
silafluofen		1	30	30
imidacloprid		0.1	35	35
Untreated plot		-	0	5

Test Example 4: Insecticidal test on resistant strain of two-spotted spider mite

[0071] A plastic-made cup having a diameter of 8 cm was filled with water and covered with a lid having a hole having a diameter of 1 cm. A notched filter paper was placed over the lid, and a part of the filter paper was hung down from the lid into the water to maintain the filter paper always in a wet state by the capillary phenomenon.

[0072] A leaf disk prepared from the first leaves of kidney bean (variety: Topcrop) was placed on the filter paper, and inoculated with 10 female adults of resistant strain of two-spotted spider mite. On a turn table, 50 ml of an agent solution diluted to a predetermined concentration was uniformly sprayed. After the spraying treatment, the whole was left to stand in a thermostatted chamber at 25°C.

[0073] Two days after the spraying treatment, the number of alive spider mites were counted, based on which the spider mites death rate were calculated. The test was carried out with two replications of 10 adults. The results are shown in Table 5.

Table 5

	Test agent	Concentration (ppm)	Death rate (%)
Compound 19	+tebufenpyrad	100+100	95
	+fenbutatin oxide	100+100	90
	+halfenprox	100+100	85
Compound 20	+tebufenpyrad	100+100	90
	+fenbutatin oxide	100+100	85
	+halfenprox	100+100	90
Compound 39	+tebufenpyrad	100+100	85
	+fenbutatin oxide	100+100	75
	+halfenprox	100+100	90
Compound 40	+tebufenpyrad	100+100	85
	+fenbutatin oxide	100+100	90
	+halfenprox	100+100	95
Compound 41	+tebufenpyrad	100+100	90
	+fenbutatin oxide	100+100	95
	+halfenprox	100+100	85
Compound 42	+tebufenpyrad	100+100	95
	+fenbutatin oxide	100+100	90
	+halfenprox	100+100	90
Compound 43	+tebufenpyrad	100+100	95
	+fenbutatin oxide	100+100	90
	+halfenprox	100+100	95
Compound 44	+tebufenpyrad	100+100	85
	+fenbutatin oxide	100+100	95
	+halfenprox	100+100	90
Compound 45	+tebufenpyrad	100+100	75

Table 5 (continued)

	Test agent	Concentration (ppm)	Death rate (%)
	+fenbutatin oxide	100+100	80
	+halfenprox	100+100	75
Compound 46	+tebufenpyrad	100+100	95
	+fenbutatin oxide	100+100	90
	+halfenprox	100+100	80
Compound 47	+tebufenpyrad	100+100	85
	+fenbutatin oxide	100+100	85
	+halfenprox	100+100	75
Compound 48	+tebufenpyrad	100+100	90
	+fenbutatin oxide	100+100	85
	+halfenprox	100+100	95
Compound 54	+tebufenpyrad	100+100	80
	+fenbutatin oxide	100+100	85
	+halfenprox	100+100	90
Compound 129	+tebufenpyrad	100+100	95
	+fenbutatin oxide	100+100	85
	+halfenprox	100+100	85
	+spirodiclofen	100+10	90
Compound 130	+tebufenpyrad	100+100	90
	+fenbutatin oxide	100+100	95
	+halfenprox	100+100	80
	+spirodiclofen	100+10	75
Compound 131	+tebufenpyrad	100+100	95
	+fenbutatin oxide	100+100	85
	+halfenprox	100+100	90
	+spirodiclofen	100+10	85
Compound 19		100	0
Compound 20		100	0
Compound 39		100	0
Compound 40		100	0
Compound 41		100	0
Compound 42		100	0
Compound 43		100	0
Compound 44		100	0
Compound 45		100	0
Compound 46		100	0
Compound 47		100	0
Compound 48		100	0
Compound 54		100	0
Compound 129		100	5
Compound 130		100	10
Compound 131		100	5
tebufenpyrad		100	60
fenbutatin oxide		100	50
halfenprox		100	35
Untreated plot		-	0

Test Example 5: Test for the effect on southern root-knot nematode (Meloidogyne incognita)

[0074] Two kilograms of a soil polluted with southern root-knot nematode was blended with a predetermined dose of a granular preparation. The mixture was filled into a 1/5,000 are Wagner pot. After sowing melon seeds and carrying out the treatment of the present invention, the pot was left to stand in a greenhouse. Sixty days after the treatment, 25 g of the soil was sampled out, the nematode was separated therefrom according to the method of Berman, and the numbers of nematodes were counted after 48 hours. The test was carried out with two replications, on one pot/group.

[0075] The results are shown in Table 6. In the tables, "ai" means active ingredient.

Table 6

Test agent		Dosage (g ai/10a)	Number of nematodes per 25 g of soil sample
Compound 19	+oxamyl	300+300	3
	+fosthiazate	300+300	1
Compound 20	+oxamyl	300+300	4
	+fosthiazate	300+300	2
Compound 39	+oxamyl	300+300	5
	+fosthiazate	300+300	1
Compound 40	+oxamyl	300+300	4
	+fosthiazate	300+300	3
Compound 41	+oxamyl	300+300	3
	+fosthiazate	300+300	2
Compound 42	+oxamyl	300+300	7
	+fosthiazate	300+300	5
Compound 43	+oxamyl	300+300	6
	+fosthiazate	300+300	2
Compound 44	+oxamyl	300+300	5
	+fosthiazate	300+300	5
Compound 45	+oxamyl	300+300	4
	+fosthiazate	300+300	2
Compound 46	+oxamyl	300+300	1
	+fosthiazate	300+300	3
Compound 47	+oxamyl	300+300	5
	+fosthiazate	300+300	3
Compound 48	+oxamyl	300+300	4
	+fosthiazate	300+300	2
Compound 54	+oxamyl	300+300	4
	+fosthiazate	300+300	2
Compound 129	+oxamyl	300+300	8
	+fosthiazate	300+300	2
Compound 130	+oxamyl	300+300	5
	+fosthiazate	300+300	1
Compound 131	+oxamyl	300+300	6
	+fosthiazate	300+300	3
Compound 19		300	36
Compound 20		300	28
Compound 39		300	34
Compound 40		300	33
Compound 41		300	31
Compound 42		300	28
Compound 43		300	36
Compound 44		300	29
Compound 45		300	30

Table 6 (continued)

Test agent		Dosage (g ai/10a)	Number of nematodes per 25 g of soil sample
Compound 46		300	36
Compound 47		300	27
Compound 48		300	33
Compound 54		300	32
Compound 129		300	45
Compound 130		300	40
Compound 131		300	41
oxamyl		300	13
fosthiazate		300	7
Untreated group		-	33

Test Example 6: Test for the control of rice water weevil (Lissorhoptrus oryzophilus) and rice blast on paddyfield rice plant by nursery box application

[0076] Fifty grams of a granular preparation was applied to rice plant (variety: Koshihikari) cultured in a nursery box. On the same day as the day of treatment (in the middle ten days of May), the rice plant was transplanted to the main paddy field. The controlling effect against rice water weevil was evaluated by investigating the number of hills classified by the extent of injury, on 100 hills in each plot, 21 days after the transplantation, and calculating the overall extent of injury therefrom. The controlling effect against rice blast was evaluated by investigating the areal rate of disease spot 60 days after the transplantation.

$$\text{Extent of injury} = \{(4A + 3B + 2C + D)/(4 \times N)\} \times 100$$

wherein A: percentage of injured leaves: 91% or higher
B: percentage of injured leaves: 61-90%
C: percentage of injured leaves: 31-60%
D: percentage of injured leaves: 1-30%
N: Number of hills investigated

[0077] The results are shown in Table 7.

Table 7

Test agent		Dosage (g ai/ Box)	Extent of injury After 21 days	Areal rate of disease spot (%) After 60 days
Compound 19	+imidacloprid +carpropamid	0.5+1+2	3.5	0.4
Compound 20	+imidacloprid +carpropamid	0.5+1+2	2.3	0.3
Compound 39	+imidacloprid +carpropamid	0.5+1+2	1.5	0.1
Compound 40	+imidacloprid +carpropamid	0.5+1+2	2.5	0.6
Compound 41	+imidacloprid +carpropamid	0.5+1+2	1.3	0.2
Compound 42	+imidacloprid +carpropamid	0.5+1+2	2.5	0.2
Compound 43	+imidacloprid +carpropamid	0.5+1+2	1.3	0.1
Compound 44	+imidacloprid +carpropamid	0.5+1+2	3.8	0.4

Table 7 (continued)

Test agent		Dosage (g ai/ Box)	Extent of injury After 21 days	Areal rate of disease spot (%) After 60 days
Compound 45	+imidacloprid +carpropamid	0.5+1+2	2.2	0.3
Compound 46	+imidacloprid +carpropamid	0.5+1+2	1.8	0.4
Compound 47	+imidacloprid +carpropamid	0.5+1+2	2.8	0.2
Compound 48	+imidacloprid +carpropamid	0.5+1+2	1.9	0.5
Compound 54	+imidacloprid +carpropamid	0.5+1+2	1.3	0.6
Compound 129	+imidacloprid +carpropamid	0.5+1+2	3.5	0.5
Compound 130	+imidacloprid +carpropamid	0.5+1+2	2.9	0.4
Compound 131	+imidacloprid +carpropamid	0.5+1+2	3.2	0.3
Compound 19		0.5	38.9	8.3
Compound 20		0.5	37.4	8.1
Compound 39		0.5	38.9	8.2
Compound 40		0.5	39.0	7.9
Compound 41		0.5	43.2	8.5
Compound 42		0.5	39.5	8.3
Compound 43		0.5	44.3	8.9
Compound 44		0.5	45.9	9.1
Compound 45		0.5	38.8	8.2
Compound 46		0.5	42.7	8.5
Compound 47		0.5	40.9	7.8
Compound 48		0.5	39.8	7.4
Compound 54		0.5	41.7	9.0
Compound 129		0.5	40.3	9.1
Compound 130		0.5	39.0	8.3
Compound 131		0.5	41.2	8.3
imidacloprid +carpropamid		1+2	5.8	1.2
Untreated plot		-	45.6	8.2

Test Example 7: Test for the control of small brown planthopper (Laodelphax striatellus) and rice leafroller (Cnaphalocrosis medinalis) on paddyfield rice plant by nursery box application

[0078] Fifty grams of a granular preparation was applied to rice plant (variety: Nihombare) cultured in a nursery box, after which the rice plant was transplanted to the main paddy field (in the middle of May). The controlling effect against small brown planthopper was evaluated by investigating the number of parasitic insects on 30 hills per each plot, 40 days and 60 days after the transplantation. The controlling effect against rice leafroller was evaluated by investigating the number of injured leaves on 100 hills per each plot, 50 days after the transplantation.

[0079] The results are shown in Table 8.

Table 8

Test agent		Dosage (g ai/ Box)	Number of parasitic planthoppers per 30 hills		Percentage of injured leaves (%)
			After 40 days	After 60 days	After 50 days
Compound	19 +imidacloprid	0.5 +1	0	4	0.03
	+benfuracarb	0.5 +2.5	17	48	0.07
Compound	20 +imidacloprid	0.5 +1	0	7	0.05
	+benfuracarb	0.5 +2.5	22	55	0.08
Compound	39 +imidacloprid	0.5 +1	0	9	0.04
	+benfuracarb	0.5 +2.5	24	45	0.07
Compound	40 +imidacloprid	0.5 +1	0	10	0.02
	+benfuracarb	0.5 +2.5	17	54	0.08
Compound	41 +imidacloprid	0.5 +1	0	6	0.04
	+benfuracarb	0.5 +2.5	33	34	0.06
Compound	42 +imidacloprid	0.5 +1	0	7	0.03
	+benfuracarb	0.5 +2.5	31	65	0.08
Compound	43 +imidacloprid	0.5 +1	0	9	0.02
	+benfuracarb	0.5 +2.5	14	33	0.06
Compound	44 +imidacloprid	0.5 +1	0	3	0.03
	+benfuracarb	0.5 +2.5	18	53	0.08
Compound	45 +imidacloprid	0.5 +1	0	4	0.02
	+benfuracarb	0.5 +2.5	25	23	0.08
Compound	46+imidacloprid	0.5 +1	0	7	0.05
	+benfuracarb	0.5 +2.5	13	54	0.09
Compound 47	+imidacloprid	0.5 +1	0	7	0.04
	+benfuracarb	0.5 +2.5	16	36	0.08
Compound 48	+imidacloprid	0.5 +1	0	6	0.03
	+benfuracarb	0.5 +2.5	33	28	0.08
Compound 54	+imidacloprid	0.5 +1	0	9	0.02
	+benfuracarb	0.5 +2.5	31	45	0.07
Compound 129	+imidacloprid	0.5 +1	0	7	0.04
	+benfuracarb	0.5 +2.5	15	57	0.08
Compound 130	+imidacloprid	0.5 +1	0	6	0.06
	+benfuracarb	0.5 +2.5	18	61	0.09
Compound 131	+imidacloprid	0.5 +1	0	8	0.05
	+benfuracarb	0.5 +2.5	20	49	0.08
Compound 19		0.5	325	389	0.16
Compound 20		0.5	315	354	0.15
Compound 39		0.5	343	372	0.25
Compound 40		0.5	322	358	0.33
Compound 41		0.5	333	385	0.35
Compound 42		0.5	345	389	0.22
Compound 43		0.5	309	334	0.17
Compound 44		0.5	323	358	0.24
Compound 45		0.5	353	395	0.13
Compound 46		0.5	349	387	0.18
Compound 47		0.5	328	365	0.11
Compound 48		0.5	345	383	0.33
Compound 54		0.5	328	334	0.25

Table 8 (continued)

Test agent		Dosage (g ai/ Box)	Number of parasitic planthoppers per 30 hills		Percentage of injured leaves (%)
			After 40 days	After 60 days	After 50 days
Compound 129		0.5	323	390	0.13
Compound 130		0.5	331	382	0.16
Compound 131		0.5	342	391	0.14
imidacloprid		1	0	29	1.63
benfuracarb		2.5	78	244	1.13
Untreated plot		-	355	388	1.54

Test Example 8: Test for the control of diamondback moth (Plutella xyloxtella) and aphid on cabbage by soil treatment

[0080] A granular preparation was mixed into bed soil, and the mixture was filled into a cell seedling box and sown with seeds of cabbage (variety: YR Seitoku). Otherwise, cell seedling planted cabbage was treated with the granular agent either by a treatment in the foliage leaf extraction period, or by a pre-transplanting treatment, or by a pricking-in hole treatment, or by a plant foot treatment after the planting. Twenty one days after the transplanting (in the middle of June), the number of parasitic insects was counted on 30 hills in the case of diamondback moth and on 10 hills in the case of aphid.

[0081] The results are shown in Table 9.

Table 9

Test agent		Dosage (mg ai/ hill)	Method of treatment	Number of parasitic insects per 30 hills	
				Diamond-back moth	Aphid
Compound 19	+imidacloprid	5+20	pre-transplanting treatment	0	0
		5+20	pricking-in hole treatment	0	0
		5+20	plant foot treatment	0	0
Compound 20	+imidacloprid	5+20	pre-transplanting treatment	0	0
		5+20	pricking-in hole treatment	0	0
		5+20	plant foot treatment	0	0
Compound 39	+imidacloprid	5+20	pre-transplanting treatment	0	0
		5+20	pricking-in hole treatment	0	0
		5+20	plant foot treatment	0	0
Compound 40	+imidacloprid	5+20	pre-transplanting treatment	0	0

Table 9 (continued)

Test agent		Dosage (mg ai/ hill)	Method of treatment	Number of parasitic insects per 30 hills	
				Diamond-back moth	Aphid
		5+20	pricking-in hole treatment	0	0
		5+20	plant foot treatment	0	0
Compound 41	+imidacloprid	5+20	pre-transplanting treatment	0	0
		5+20	pricking-in hole treatment	0	0
		5+20	plant foot treatment	0	0
Compound 42	+imidacloprid	5+20	pre-transplanting treatment	0	0
		5+20	pricking-in hole treatment	0	0
		5+20	plant foot treatment	0	0
Compound 43	+imidacloprid	5+20	pre-transplanting treatment	0	0
		5+20	pricking-in hole treatment	0	0
		5+20	plant foot treatment	0	0
Compound 44	+imidacloprid	5+20	pre-transplanting treatment	0	0
		5+20	pricking-in hole treatment	0	0
		5+20	plant foot treatment	0	0
Compound 45	+imidacloprid	5+20	pre-transplanting treatment	0	0
		5+20	pricking-in hole treatment	0	0
		5+20	plant foot treatment	0	0
Compound 46	+imidacloprid	5+20	pre-transplanting treatment	0	0
		5+20	pricking-in hole treatment	0	0
		5+20	plant foot treatment	0	0
Compound 47	+imidacloprid	5+20	pre-transplanting treatment	0	0

Table 9 (continued)

Test agent		Dosage (mg ai/ hill)	Method of treatment	Number of parasitic insects per 30 hills	
				Diamond-back moth	Aphid
		5+20	pricking-in hole treatment	0	0
		5+20	plant foot treatment	0	0
Compound 48	+imidacloprid	5+20	pre-transplanting treatment	0	0
		5+20	pricking-in hole treatment	0	0
		5+20	plant foot treatment	0	0
Compound 54	+imidacloprid	5+20	pre-transplanting treatment	0	0
		5+20	pricking-in hole treatment	0	0
		5+20	plant foot treatment	0	0
Compound 129	+imidacloprid	5+20	pre-transplanting treatment	0	0
		5+20	pricking-in hole treatment	0	0
		5+20	plant foot treatment	0	0
Compound 130	+imidacloprid	5+20	pre-transplanting treatment	0	0
		5+20	pricking-in hole treatment	0	0
		5+20	plant foot treatment	0	0
Compound 131	+imidacloprid	5+20	pre-transplanting treatment	0	0
		5+20	pricking-in hole treatment	0	0
		5+20	plant foot treatment	0	0
Compound 19		5	soil incorporation	1	445
		5	true leaf extraction season treatment	2	457
		5	pre-transplanting treatment	1	399

Table 9 (continued)

Test agent		Dosage (mg ai/ hill)	Method of treatment	Number of parasitic insects per 30 hills	
				Diamond-back moth	Aphid
		5	pricking-in hole treatment	1	467
		5	plant foot treatment	2	489
Compound 20		5	soil incorporation	4	512
		5	true leaf extraction season treatment	2	498
		5	pre-transplanting treatment	6	478
		5	pricking-in hole treatment	3	499
		5	plant foot treatment	5	501
Compound 39		5	soil incorporation	3	513
		5	true leaf extraction season treatment	2	487
		5	pre-transplanting treatment	4	457
		5	pricking-in hole treatment	3	437
		5	plant foot treatment	2	456
Compound 40		5	soil incorporation	2	472
		5	true leaf extraction season treatment	1	510
		5	pre-transplanting treatment	1	477
		5	pricking-in hole treatment	1	486
		5	plant foot treatment	3	478
Compound 41		5	soil incorporation	3	457
		5	true leaf extraction season treatment	2	495

Table 9 (continued)

Test agent		Dosage (mg ai/ hill)	Method of treatment	Number of parasitic insects per 30 hills	
				Diamond-back moth	Aphid
		5	pre-transplanting treatment	1	458
		5	pricking-in hole treatment	2	511
		5	plant foot treatment	2	456
Compound 42		5	soil incorporation	3	475
		5	true leaf extraction season treatment	2	485
		5	pre-transplanting treatment	3	435
		5	pricking-in hole treatment	1	473
		5	plant foot treatment	3	498
Compound 43		5	soil incorporation	2	501
		5	true leaf extraction season treatment	2	448
		5	pre-transplanting treatment	3	482
		5	pricking-in hole treatment	1	447
		5	plant foot treatment	2	467
Compound 44		5	soil incorporation	3	449
		5	true leaf extraction season treatment	2	502
		5	pre-transplanting treatment	3	498
		5	pricking-in hole treatment	3	478
		5	plant foot treatment	2	492
Compound 45		5	soil incorporation	2	472

Table 9 (continued)

Test agent		Dosage (mg ai/ hill)	Method of treatment	Number of parasitic insects per 30 hills	
				Diamond-back moth	Aphid
		5	true leaf extraction season treatment	2	463
		5	pre-transplanting treatment	1	472
		5	pricking-in hole treatment	5	465
		5	plant foot treatment	4	489
Compound 46		5	soil incorporation	1	505
		5	true leaf extraction season treatment	3	498
		5	pre-transplanting treatment	1	479
		5	pricking-in hole treatment	3	447
		5	plant foot treatment	2	469
Compound 47		5	soil incorporation	3	438
		5	true leaf extraction season treatment	2	499
		5	pre-transplanting treatment	4	452
		5	pricking-in hole treatment	1	477
		5	plant foot treatment	2	511
Compound 48		5	soil incorporation	5	502
		5	true leaf extraction season treatment	2	442
		5	pre-transplanting treatment	5	476
		5	pricking-in hole treatment	1	492

Table 9 (continued)

Test agent		Dosage (mg ai/ hill)	Method of treatment	Number of parasitic insects per 30 hills	
				Diamond-back moth	Aphid
		5	plant foot treatment	4	456
Compound 54		5	soil incorporation	1	478
		5	true leaf extraction season treatment	3	459
		5	pre-transplanting treatment	1	487
		5	pricking-in hole treatment	3	499
		5	plant foot treatment	2	463
Compound 129		5	soil incorporation	2	455
		5	true leaf extraction season treatment	1	458
		5	pre-transplanting treatment	2	402
		5	pricking-in hole treatment	3	397
		5	plant foot treatment	1	481
Compound 130		5	soil incorporation	1	453
		5	true leaf extraction season treatment	1	399
		5	pre-transplanting treatment	1	421
		5	pricking-in hole treatment	2	467
		5	plant foot treatment	1	498
Compound 131		5	soil incorporation	1	432
		5	true leaf extraction season treatment	1	465

Table 9 (continued)

Test agent		Dosage (mg ai/ hill)	Method of treatment	Number of parasitic insects per 30 hills	
				Diamond-back moth	Aphid
		5	pre-transplanting treatment	2	428
		5	pricking-in hole treatment	2	391
		5	plant foot treatment	1	486
imidacloprid		20	pre-transplanting treatment	35	10
		20	picking-in hole treatment	40	16
		20	plant foot treatment	38	13
Untreated plot		-		41	479
Note: The effect in soil incorporation and true leaf extraction season treatment could not be evaluated due to phytotoxicity, in cases of a single use of imidacloprid and a mixed use of imidacloprid.					

Test Example 9: Test for the effect against cutworm on beet

[0082] Beet seedlings (variety: Monoace S) planted in a paper pot was treated with 3 L/m^2 of a solution of an agent diluted to a predetermined concentration, by the method of drench. Just after the drench, the plant was set. Predetermined days after the setting, the number of injured hills per 100 hills was counted. The test was carried out with two replications, 80 m^2 per one plot.

[0083] The results are shown in Table 10.

Table 10

Test agent		Dosage (g ai/10a)	Number of injured hills per 100 hills		
			After 60 days	After 90 days	After 120 days
Compound 19	+acephate	15+50	0	3	11
Compound 20	+acephate	15+50	0	4	10
Compound 39	+acephate	15+50	0	2	8
Compound 40	+acephate	15+50	0	1	7
Compound 41	+acephate	15+50	0	5	9
Compound 42	+acephate	15+50	0	4	10
Compound 43	+acephate	15+50	0	2	6
Compound 44	+acephate	15+50	0	3	8
Compound 45	+acephate	15+50	0	1	5
Compound 46	+acephate	15+50	0	4	11
Compound 47	+acephate	15+50	0	5	12
Compound 48	+acephate	15+50	0	2	5
Compound 54	+acephate	15+50	0	2	6
Compound 129	+acephate	15+50	0	3	14
Compound 130	+acephate	15+50	0	2	9
Compound 131	+acephate	15+50	0	5	12
Compound 19		15	0	8	21

Table 10 (continued)

Test agent		Dosage (g ai/10a)	Number of injured hills per 100 hills		
			After 60 days	After 90 days	After 120 days
Compound 20		15	0	7	20
Compound 39		15	0	6	17
Compound 40		15	0	9	23
Compound 41		15	0	7	21
Compound 42		15	0	8	22
Compound 43		15	0	6	19
Compound 44		15	0	7	20
Compound 45		15	0	9	23
Compound 46		15	0	8	20
Compound 47		15	0	9	21
Compound 48		15	0	7	18
Compound 54		15	0	8	19
Compound 129		15	0	10	22
Compound 130		15	0	7	19
Compound 131		15	0	8	21
acephate		50	2	14	24
Untreated plot		-	6	26	30

Test Example 10: Test for the control of citrus yellow thrips (Frankliniella occidentalis) on egg plant by the combined use with natural enemy pesticide

[0084] An agent solution diluted to a predetermined concentration was sprayed by means of a shouldered spraying machine to citrus yellow thrips (Frankliniella occidentalis) parasitic on egg-plant (variety: Senryo No.2) in a vinyl house. After air-dryness, 100 heads per hill of Amblyseius cucumeris were let inoculate. Fourteen days, twenty one days and twenty eight days after the treatment, the numbers of citrus yellow thrips and Amblyseius cucumeris were counted on twenty leaves showing a most serious injury (the first ten days of June).

[0085] The results are shown in Table 11.

Table 11

Test agent		Amount applied (ppm or adults number)	Number of parasitic insects per 20 leaves		
			After 14 days	After 21 days	After 28 days
Compound 19	+Amblyseius cucumeris	100ppm+100 adults/hill	2	0	3
Compound 20	+Amblyseius cucumeris	100ppm+100 adults/hill	3	0	2
Compound 39	+Amblyseius cucumeris	100ppm+100 adults/hill	1	0	1
Compound 40	+Amblyseius cucumeris	100ppm+100 adults/hill	4	0	4
Compound 41	+Amblyseius cucumeris	100ppm+100 adults/hill	5	1	6
Compound 42	+Amblyseius cucumeris	100ppm+100 adults/hill	3	0	4
Compound 43	+Amblyseius cucumeris	100ppm+100 adults/hill	1	0	2
Compound 44	+Amblyseius cucumeris	100ppm+100 adults/hill	1	0	1

Table 11 (continued)

Test agent		Amount applied (ppm or adults number)	Number of parasitic insects per 20 leaves		
			After 14 days	After 21 days	After 28 days
Compound 45	+Amblyseius cucumeris	100ppm+100 adults/hill	2	0	4
Compound 46	+Amblyseius cucumeris	100ppm+100 adults/hill	4	1	6
Compound 47	+Amblyseius cucumeris	100ppm+100 adults/hill	1	0	2
Compound 48	+Amblyseius cucumeris	100ppm+100 adults/hill	3	1	5
Compound 54	+Amblyseius cucumeris	100ppm+100 adults/hill	2	0	2
Compound 129	+Amblyseius cucumeris	100ppm+100 adults/hill	2	0	3
Compound 130	+Amblyseius cucumeris	100ppm+100 adults/hill	4	0	2
Compound 131	+Amblyseius cucumeris	100ppm+100 adults/hill	3	0	4
Compound 19		100ppm	20	27	55
Compound 20		100ppm	21	28	49
Compound 39		100ppm	19	32	58
Compound 40		100ppm	22	31	52
Compound 41		100ppm	18	29	59
Compound 42		100ppm	19	25	50
Compound 43		100ppm	23	31	57
Compound 44		100ppm	25	33	53
Compound 45		100ppm	18	29	59
Compound 46		100ppm	20	34	57
Compound 47		100ppm	21	27	52
Compound 48		100ppm	19	31	59
Compound 54		100ppm	18	25	61
Compound 129		100ppm	19	29	51
Compound 130		100ppm	21	28	50
Compound 131		100ppm	23	30	54
Amblyseius cucumeris		100 adults/hill	8	5	15
Untreated plot		-	22	32	58

Test Example 11: Test for the control of rice leafroller (Cnaphalocrocis medinalis), rice blast, barnyard grass (Echinochloa crus-galli) and bulrush (Scirpus juncoides Roxb.) on paddyfield rice plant by submerged application to main paddyfield

[0086] Ten days after the transplantation (in the middle ten days of May), a granular preparation was applied to water surface of main paddyfield. The controlling effect on rice leafroller was evaluated by counting the injured leaves on each plot (100 hills) 50 days after the transplantation, and calculating the percentage of injured leaves therefrom. The effect against rice blast was evaluated by measuring the areal rate of disease spot 60 days after the transplantation. The effects against barnyard grass and bulrush were evaluated by measuring the herbicidal effect by the naked eye four weeks after the treatment and expressing the result by numerically (0 means "no effect", and 10 means "complete withering"). At the same time, the chemical injury on rice plant was also evaluated (0 means "no influence").

[0087] The results are shown in Table 12.

Table 12

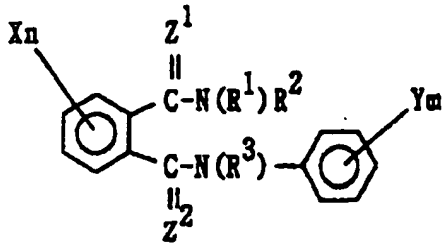
Test agent Test Dosage (g ai/10a)		Percentage of injured leaves (%)	Areal rate of diseasespot (%)	Herbicidal effect		Phytotoxicity
		After 50 days	After 60 days	barnyard grass	fulrush	rice
Compound 129	+pyroquilon +bensulfron- +indanofanmethyl	0.13	0.5	10	10	0
	10.0 + 150.0 + 5.0 + 15.0					
Compound 129	+fenoxanyl +bensulfron- +indanofanmethyl	0.12	0.4	10	10	0
	10.0 + 250.0 + 5.0 + 15.0					
Compound 130	+pyroquilon +bensulfron- +indanofanmethyl	0.11	0.3	10	10	0
	10.0 + 150.0 + 5.0 + 15.0					
Compound 130	+fenoxanyl +bensulfron- +indanofanmethyl	0.15	0.5	10	10	0
	10.0 + 250.0 + 5.0 + 15.0					
Compound 131	+pyroquilon +bensulfron- +indanofanmethyl	0.13	0.3	10	10	0
	10.0 + 250.0 + 5.0 + 15.0					
Compound 131	+fenoxanyl +bensulfron- +indanofanmethyl	0.14	0.4	10	10	0
	10.0 + 250.0 + 5.0 + 15.0					
Compound 129	10.0	0.15	8.1	0	0	0
Compound 130	10.0	0.13	7.9	0	0	0
Compound 131	10.0	0.16	8.3	0	0	0
	pyroquilon +bensulfron- +indanofan methyl	1.56	0.6	10	10	0
	250.0 + 5.0 + 15.0					

Table 12 (continued)

Test agent Test Dosage (g ai/10a)		Percentage of injured leaves (%)	Areal rate of diseasespot (%)	Herbicidal effect		Phytotoxicity
		After 50 days	After 60 days	barnyard grass	fulrush	rice
	fenoxanyl +bensulfron- +indanofan methyl	1.63	0.8	10	10	0
	250.0 + 5.0 + 15.0					
Untreated plot	-	1.66	8.2	0	0	0

Claims

1. A composition for noxious organisms-controlling agent comprising, as active ingredients thereof, one or more compounds selected from phthalamide derivatives represented by general formula (I) :



(I)

wherein R^1, R^2 and R^3, which may be the same or different, each represent a hydrogen atom, a C_3-C_6 cycloalkyl group, a halo C_3-C_6 cycloalkyl group or -A^1-Q_p (in this formula, A^1 represents a C_1-C_8 alkylene group, a C_3-C_6 alkenylene group or a C_3-C_6 alkynylene group; Q represents a hydrogen atom; a halogen atom; a cyano group; a nitro group; a halo C_1-C_6 alkyl group; a C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkyl group; a C_1-C_6 alkoxycarbonyl group; a di C_1-C_6 alkoxyphosphoryl group in which the alkoxy groups may be the same or different; a di C_1-C_6 alkoxythiophosphoryl group in which the alkoxy groups may be the same or different; a diphenylphosphino group; a diphenylphosphono group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group means a pyridyl group, a pyridine-N-oxide group, a pyrimidinyl group, a furyl group, a tetrahydrofuryl group, a thienyl group, a tetrahydrothienyl group, a tetrahydropyranyl group, a tetrahydrothiopyranyl group, an oxazolyl group, an isoxazolyl group, an oxadiazolyl group, a thiazolyl group, an isothiazolyl group, a thiadiazolyl group, an imidazolyl group, a triazolyl group or a pyrazolyl group); a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; or -Z^3-R^4 (in this formula, Z^3 represents -O-, -S-, -SO-, -SO_2- or -N(R^5)- (in this formula, R^5 represents a hydrogen atom; a C_1-C_6 alkylcarbonyl group; a halo C_1-C_6 alkylcarbonyl group; a C_1-C_6 alkoxycarbonyl group; a phenylcarbonyl group; a substituted phenylcarbonyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkyl-

sulfonyl group and halo C_1-C_6 alkylsulfonyl group; a phenyl C_1-C_4 alkoxycarbonyl group; or a substituted phenyl C_1-C_4 alkoxycarbonyl group having, on the ring thereof, at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group), and R^4 represents a hydrogen atom; a C_1-C_6 alkyl group; a halo C_1-C_6 alkyl group;, a C_3-C_6 alkenyl group; a halo C_3-C_6 alkenyl group; a C_3-C_6 alkynyl group; a halo C_3-C_6 alkynyl group; a C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkyl group; a C_1-C_6 alkylcarbonyl group; a halo C_1-C_6 alkylcarbonyl group; a C_1-C_6 alkoxycarbonyl group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a phenyl C_1-C_4 alkyl group; a substituted phenyl C_1-C_4 alkyl group having, on the ring thereof, at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group is as defined above); or a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group); and p represents an integer of 1-4); and R^1 and R^2 may be taken conjointly to form a 4- to 7-membered ring which may be interrupted by one to three, the same or different hetero atoms selected from oxygen atom, sulfur atom or nitrogen atom;

X may be the same or different and represents a hydrogen atom; a halogen atom; a cyano group; a nitro group; a C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkyl group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group is as defined above); a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; or -A^2-R^6 (in this formula, A^2 represents -O-, -S-, -SO-, -SO_2-, -C(=O)-, -C(=NOR^7)- (in this formula, R^7 represents a hydrogen atom, a C_1-C_6 alkyl group, a halo C_1-C_6 alkyl group, a C_3-C_6 alkenyl group, a halo C_3-C_6 alkenyl group, a C_3-C_6 alkynyl group, a cycle C_3-C_6 alkyl group, a phenyl C_1-C_4 alkyl group or a substituted phenyl C_1-C_4 alkyl group having, on the ring thereof, at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group), a C_1-C_6 alkylene group, a halo C_1-C_6 alkylene group, a C_2-C_6 alkenylene group, a halo C_2-C_6 alkenylene group, a C_2-C_6 alkynylene group or a halo C_3-C_6 alkynylene group, and

(1) in a case where A^2 represents -O-, -S-, -SO-or -SO_2-, R^6 represents a halo C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkenyl group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group is as defined above); a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; or -A^3-R^8 (in this formula, A^3 represents a C_1-C_6 alkylene group, a halo C_1-C_6 alkylene group, a C_3-C_6 alkenylene group, a halo C_3-C_6 alkenylene group, a C_3-C_6 alkynylene group or a halo C_3-C_6 alkynylene group, and R^8 represents a hydrogen atom; a halogen atom; a C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkyl group; a C_1-C_6 alkoxycarbonyl group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; or -A^4-R^9 (in this

formula, A^4 represents -O-, -S-, -SO-, $-SO_2-$ or -C(=O), and R^9 represents a C_1-C_6 alkyl group; a halo C_1-C_6 alkyl group; a C_3-C_6 alkenyl group; a halo C_3-C_6 alkenyl group; a C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkyl group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group is as defined above); or a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group)),

(2) in a case where A^2 represents -C(=O)- or -C(=NOR^7) - (in this formula, R^7 is as defined above), R^6 represents a C_1-C_6 alkyl group; a halo C_1-C_6 alkyl group; a C_2-C_6 alkenyl group; a halo C_2-C_6 alkenyl group; a C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkyl group; a C_1-C_6 alkoxy group; a C_1-C_6 alkylthio group; a mono C_1-C_6 alkylamino group; a di C_1-C_6 alkylamino group in which the alkyl groups may be the same or different; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a phenylamino group; a substituted phenylamino group having, on the ring thereof, at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group is as defined above); or a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group, and

(3) in a case where A^2 represents a C_1-C_6 alkylene group, a halo C_1-C_6 alkylene group, a C_2-C_6 alkenylene group, a halo C_2-C_6 alkenylene group, a C_2-C_6 alkynylene group or a halo C_3-C_6 alkynylene group, R^6 represents a hydrogen atom; a halogen atom; a C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkyl group; a C_1-C_6 alkoxycarbonyl group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group is as defined above); a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; or -A^5-R^{10} (in this formula, A^5 represents -O-,-S-, -SO- or $-SO_2-$, and R^{10} represents a C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkyl group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group is as defined above); a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; or -A^6-R^{11} (in this formula, A^6 represents a C_1-C_6 alkylene group; a halo C_1-C_6 alkylene group; a C_2-C_6 alkenylene group,; a halo C_2-C_6 alkenylene group; a C_2-C_6 alkynylene group; or a halo C_3-C_6 alkynylene group; and R^{11} represents a hydrogen atom; a halogen atom; a C_3-C_6 cycloalkyl group; a halo C_3-C_6 cycloalkyl group; a C_1-C_6 alkoxy group; a halo C_1-C_6 alkoxy group; a C_1-C_6 alkylthio group; a halo C_1-C_6 alkylthio group; a C_1-C_6 alkylsulfinyl group; a halo C_1-C_6 alkylsulfinyl group; a C_1-C_6 alkylsulfonyl group; a halo C_1-C_6 alkylsulfonyl group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl

group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a phenoxy group; a substituted phenoxy group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a phenylthio group; a substituted phenylthio group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group is as defined above; or a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group))), and

n represents an integer of 1-4;

and X may be taken conjointly together with an adjacent carbon atom on the phenyl ring to form a condensed ring (the term condensed ring means naphthalene, tetrahydronaphthalene, indene, indane, quinoline, quinazoline, chromane, isochromane, indole, indoline, benzodioxane, benzodioxole, benzofuran, dihydrobenzofuran, benzothiophene, dihydrobenzothiophene, benzoxazole, benzothiazole, benzimidazole or indazole), and said condensed ring may have at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group, halo C_1-C_6 alkylsulfonyl group, phenyl group, substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group, heterocyclic group (the term heterocyclic group is as defined above) and substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; and

Y may be the same or different and represents a hydrogen atom; a halogen atom; a cyano group; a nitro group; a halo C_3-C_6 cycloalkyl group; a phenyl group; a substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; a heterocyclic group (the term heterocyclic group is as defined above); a substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; or $-A^2-R^6$ (in this formula, A^2 and R^6 are as defined above); and m represents an integer of 1-5; and

Y may be taken conjointly together with an adjacent carbon atom on the phenyl ring to form a condensed ring (the term condensed ring is as defined above), and said condensed ring may have at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group, halo C_1-C_6 alkylsulfonyl group, phenyl group, substituted phenyl group having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group, heterocyclic group (the term heterocyclic group is as defined above) and substituted heterocyclic group (the term heterocyclic group is as defined above) having at least one, the same or different substituents selected from the group consisting of halogen atom, C_1-C_6 alkyl group, halo C_1-C_6 alkyl group, C_1-C_6 alkoxy group, halo C_1-C_6 alkoxy group, C_1-C_6 alkylthio group, halo C_1-C_6 alkylthio group, C_1-C_6 alkylsulfinyl group, halo C_1-C_6 alkylsulfinyl group, C_1-C_6 alkylsulfonyl group and halo C_1-C_6 alkylsulfonyl group; and

Z^1 and Z^2 represent an oxygen atom or a sulfur atom; and

one or more compounds selected from compounds having an insecticidal, acaricidal or nematocidal activity.

2. A composition for noxious organisms-controlling agent according to Claim 1, wherein R^1 represents a hydrogen atom, R^2 represents a C_1-C_6 alkyl group, a C_1-C_6 alkylthio C_1-C_6 alkyl group, a C_1-C_6 alkylsulfinyl C_1-C_6 alkyl group or a C_1-C_6 alkylsulfonyl C_1-C_6 alkyl group, R^3 represents a hydrogen atom, X represents a halogen atom, n represents 1, each of Z^1 and Z^2 represents an oxygen atom, Y may be the same or different and represents a halogen atom, a C_1-C_6 alkyl group, a halo C_1-C_6 alkyl group or a halo C_1-C_6 alkoxy group, and m represents 2 or 3.

3. A composition for noxious organisms-controlling agent according to Claim 2, wherein the phthalamide derivative represented by general formula (I) is N^2-(1,1-dimethyl-2-methylthioethyl)-3-iodo-N^1-{2-methyl-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)-ethyl]phenyl}phthalamide, N^2-(1,1-dimethyl-2-methylsulfonylethyl)-3-iodo-N^1-{2-methyl-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-phenyl}-phthalamide or N^2-(1,1-dimethyl-2-methylsulfinylethyl)-3-iodo-N^1-{2-methyl-4-[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]phenyl}phthalamide.

4. A composition for noxious organisms-controlling agent according to any one of Claims 1 to 3, wherein said one or more compounds having an insecticidal, acaricidal or nematocidal activity is at least one compound selected from the group consisting of acetamiprid, pymetrozine, fenitrothion, carbaryl, methomyl, cartap, cyhalothrin, ethofenprox, teflubenzuron, flufenoxuron, tebufenozide, fenpyroximate, pyridaben, imidacloprid, buprofezin, BPMC (fenobucarb), malathion, methidathion, fenthion, diazinon, acephate, oxydeprofos, vamidothion, ethiophencarb, pirimicarb, permethrin, cypermethrin, bifenthrin, halfenprox, silafluofen, nitenpyram, chlorfluazuron, methoxyfenozide, tebufenpyrad, pyrimidifen, dicofol, propargite, hexythiazox, clofentezine, spinosad, milbemectin, BT (bacillus thuringiensis), indoxacarb, chlorfenapyr, fipronil, etoxazole, acequinocyl, pirimiphos-methyl, acrinathrin, quinomethionate, chlorpyrifos, avermectin, emamectin-benzoate, fenbutatin oxide, terbufos, ethoprophos, cadusafos, fenamiphos, fensulfothion, DSP, dichlofenthion, fosthiazate, oxamyl, isamidofos, fosthietan, isazofos, thionazin, benfuracarb and spirodiclofen,

5. A composition for noxious organisms-controlling agent according to any one of Claims 1 to 4, wherein the amount of said one or more compounds selected from compounds having an insecticidal, acaricidal or nematocidal activity is 0.05 to 2,000 parts by weight per part by weight of the phthalamide derivative.

6. A method for using a composition for noxious organisms-controlling agent **characterized by** treating an objective noxious organism, an objective useful plant, a seed of an objective useful plant, soil or a cultivation carrier with an effective amount of the composition for noxious organisms-controlling agent according to any one of Claims 1 to 5 for the purpose of protecting an useful plant from a noxious organism.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP02/03780

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl[7] A01N37/24, 37/28, 37/34, 41/10, 43/28, 43/40, A01N43/56, 43/58, 43/88, 47/02, 51/00, 57/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
Int.Cl[7] A01N37/24, 37/28, 37/34, 41/10, 43/28, 43/40, A01N43/56, 43/58, 43/88, 47/02, 51/00, 57/22

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	EP 919542 A2 (Nihon Nohyaku Co., Ltd.), 02 June, 1999 (02.06.99), Particularly, Claims; Par. No. [0100] & JP 11-240857 A	1-3,5,6 4
Y	JP 2001-64268 A (Nihon Nohyaku Co., Ltd.), 13 March, 2001 (13.03.01), (Family: none)	4
P,X	JP 2001-131141 A (Nihon Nohyaku Co., Ltd.), 15 May, 2001 (15.05.01), (Family: none)	1-6
P,X	JP 2001-158764 A (Nihon Nohyaku Co., Ltd.), 12 June, 2001 (21.06.01), (Family: none)	1-6

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
24 June, 2002 (24.06.02)	09 July, 2002 (09.07.02)
Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer
Facsimile No.	Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP02/03780

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	JP 2001-240580 A (Nihon Nohyaku Co., Ltd.), 04 September, 2001 (04.09.01), (Family: none)	1-6

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